Note:	The Bioer Co. reserves the right to modify this manual at any time without notice.

Patent materials are included in this manual. All rights reserved. Any part of this manual shall be forbidden to photocopy, reproduce, or translate into other languages, without written permission from the Bioer Co.

Please read this manual carefully before the Thermal Cycler is first operated!

Document Number: BYQ60210000000BSM
Document Version: August , 2009 Version 2.9

Important Note

1 CONVENTIONS

Note:	Because there is important information in this item, please read it carefully. Failure to follow the advice here will possibly result in damage or malfunctioning of the Thermal Cycler.

Warning!	This symbol means that you should be cautious to take an operation/procedure. Failure to follow the requirements in this item will possibly result in personal injury.

2 SAFETY

During the operation, maintenance, or repair of the XP Thermal Cycler, the following safety measures should be taken. Otherwise, the guard provided by the Thermal Cycler is likely to be damaged, while the rated safety level to be reduced, and the rated operation conditions to be affected.

The Bioer Co. shall not be in any way responsible for the consequences resulted from operators not following the requirements.

Note:	The Thermal Cycler, complying with the National Standard EN61010-2-010 & EN61326-1, is a general instrument of class Ⅰ, the protection degree is IP20. It applies to indoor and below an elevation of 2000 meters.

a) Grounding Considerations

A.C. power's grounding should be grounded reliably for fear of an electric shock. The 3-pin plug with the Thermal Cycler's power line is a safety device that should be matched with a grounded socket. Never let the third ground pin floating. If the 3-pin plug cannot be inserted, it is recommended to ask an electrician to install an appropriate power socket.

b) Keep Away from Electric Circuits

The operator is not allowed to open the Thermal Cycler. To changing components or adjust certain parameters inside the device must only be accomplished by the certificated professional maintenance personnel. Do not change elements while the power is still on.

c) A.C. Power Considerations

Before turn on the power, always check if the mains voltage is within the required A.C. 220-240V and whether the current rating of the power socket meet the required specification, i.e. 800W MAX.

d) A.C. Power Line Considerations

As an accessory of the Thermal Cycler, the A.C. power line used should be a default one. If it is damaged, the A.C. power line may not be repaired, but could be replaced by a new one with same model and specification. The power line should be free of heavy objects during the Thermal Cycler's operation. Keep the power line away from the place where people gather regularly.

e) Connect the A.C. Power Line

While connect or disconnect the power line, you should hold the 3-pin plug with your hand. Insert the plug thoroughly to ensure good contact between the plug and socket. Pull the plug, but not the line, when you need to disconnect to the mains.

f) Requested Environments

The Thermal Cycler should be placed in a low-humidity, dust-free, and good-ventilation room without caustic gas or powerful magnetic interference. In addition, water sources, such as pools and water pipes, should be kept a distance from the Thermal Cycler.

Never cover or obstruct the openings of the Thermal Cycler, which are designed for ventilation and prevent the device's interior from being too hot. When a single device is running, the shortest distance between its openings and the nearest object is 50cm; when two or more devices are running at the same time, the shortest distance is 100 cm. Do not place the device on a soft surface, for that will result in adverse ventilation near the device's bottom openings.

Too high temperature will lead to degraded performance or failure of the Thermal Cycler. Therefore, the device should be protected against any kind of heat sources like sunlight, ovens, or central heating equipment.

If the Thermal Cycler is set aside for a long time, it is recommended to disconnect the power line to mains and cover the device with a piece of soft cloth or plastic to prevent dust from entering.

Note:	Once one of the following events occurs, you are suggested to disconnect the power line with mains, and contact the distributor or ask a certificated maintenance personnel for help. ● Liquid into the device; ● The device sprinkled or drenched; ● The device malfunctioning, giving off abnormal sound or odor; ● The device falling onto the floor or its shell damaged; ● Significant changes in the device's performance.

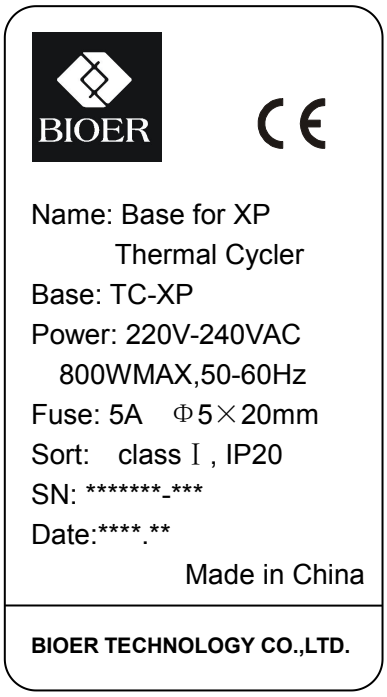
3 EMC Consideration

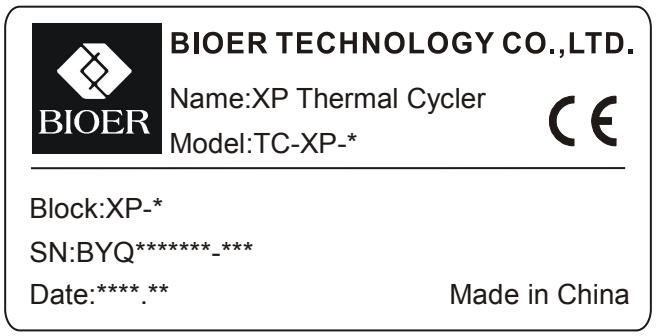
Note:	This is a class A equipment, only suitable for use in establishments other than domestic, and those directly connected to a low voltage power supply network which supplies buildings used for domestic purpose.

4 Protection Degree: IP 20

5 LABELS

a）Tablet





b）Warning Sign

Warning!	There are two warning signs read 'HOT SURFACE!' During the program execution and in the short period after the program execution, the metal part near those signs (on the block and hotlid) is not allowed to be touched by any part of the body for fear of the body burn!

6 MAINTENANCE

The conical holes over the block should be cleaned regularly with soaked cotton swab in order to ensure sufficient contact and thus good heat conduction between each conical hole and the tube inside it.

In case it is smeared, the surface of the Thermal Cycler can be scrubbed with a piece of dehydrated soft wet cloth.

Warning!	When cleaning, the instrument should be off. Corrosive scour is not allowed to clean the surface of the instrument.

7 WARRANTY AND SERVICE INFORMATION

a）Warranty

The Thermal Cycler is warranted for a period of one month, from the date of shipment from the company, to be free from defects in material and workmanship. The Bioer Co. shall be obligated, under this warranty, to exchange the XP Thermal Cycler that proves to be defective as described herein.

XP Thermal Cycler is also warranted for a period of twelve months, from date of shipment from the company, to be free repaired for defects in material and workmanship. The Bioer Co.'s obligation under this warranty shall be limited to repair or exchange (at the Bioer Co.'s option) of XP Thermal Cycler that proves to be defective as described herein.

The buyer is responsible for deliver to the maintenance shop designated by the Bioer Co. on all warranty claims. The buyer is also responsible for the transportation expenses of the freight to the maintenance shop. The Bioer Co. shall be responsible for the transportation expenses of the freight to the buyer (which is only applicable to domestic buyers).

After the warranty comes due, the Bioer Co. reserves the right to charge cost price for maintenance of a defective device.

b）Warranty Terms

The above warranty is not applicable to defective devices with incorrect use, abnormal operating conditions, improper application, and unauthorized maintenance or alteration.

The Bioer Co. makes no express warranties other than those that are described herein. *Any descriptions in sales promotion under specific conditions shall not create an express warranty that the goods shall conform to such description.*

c） After-sell services hotline:+86-571-87774558

Note:	Once it is opened, the package should be checked according to the packing list. If the buyer finds any items to be missing or damaged, do not hesitate to contact the distributor. After the acceptance check is passed, the buyer should fill out the check form and send its photocopy (or fax it) to the distributor. The Bioer Co. establishes the archives and maintenance records with the returned form. Please store the package and packing materials in a safe place in case of future device maintenance. The above warranty does not extend to goods damaged as the result of cheesy package.

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CHAPTER 1 INTRODUCTION

This chapter briefly introduces PCR technique and its applications, PCR thermal cyclers, and the characteristics of XP Thermal Cycler.

1. Brief Introduction of PCR Technique

PCR (Polymerase Chain Reaction), or cell-free molecule cloning, is a technique for amplifying nucleic acids in vitro, emulating natural DNA replication process. The PCR technique, using two DNA strands to be amplified as template, and a pair of synthetic oligonucleotides as primers, rapidly reproduces the specific DNA pieces under the catalysis of a thermostable DNA polymerase. Because of its simplicity, rapidity, specificity, and sensitivity, PCR has been widely applied to all fields of life sciences since its invention by Mullis in 1983 and the discovery of the thermostable DNA polymerase by Erlich in 1989. Great achievements have been obtained in PCR's applications in such areas as cytology, virology, oncology, genetics, forensics, and immunology. PCR technology is a milestone in the history of modern molecular biology.

2. PCR Applications

Research Areas	Gene cloning, DNA sequencing, mutation analysis, gene recombination and mutagenesis, identification and adjustment of DNA sequence of protein structure, detection of gene extension, construction of synthetic genes, construction of cloning and expression carrier, detection of polymorphism of a gene's inscribed enzyme;
Clinical Diagnoses	Bacteria (spirochaeta, rickettsia, diphtheria bacillus, colon bacillus, dysentery bacillus, and clostridium); Virus (HTLV, HIV, HBV, HCV, HPVS, EV, CMV, EBV, HSV, measles virus, rotiform virus, B19 virus, and Lhasa virus); Parasite (malaria); Human hereditary diseases (Lesh-Nyhan syndrome, hemophilia, BMD, and DMD);
Immunology	HLA locus typing, qualitative analysis of T-cell receptor or antibody diversification, immune body gene mapping, quantitative analysis of lymph genes;
Human Genome Project	Identification of DNA markers using discrete repetitive; Sequence, construction of a genetic linkage map (detection of DNA, polymorphism, or semen mapping); Construction of a physical map, sequencing, and map expression;
Forensics	Specimen analysis in the venue, and HLA-DQα locus typing;
Oncology	Pancreas cancer, rectum cancer, lung cancer, thyroid gland cancer, melanin cancer, and leukemia;
Social and Colony Biology	Genetic species research, evolution research, animal protection research, ecology, environmental sciences, and experimental genetics;
Paleontology	Specimen analysis in archeology and museum;
Biology	Diagnosis of animal hereditary diseases and detection of plant pathogeny.

3. Features

TC-XP Thermal Cycler is a PCR detection system with multiple functions. It has features and characteristics as followings:

- Provide eight kinds of interchangeable block units to meet various PCR experiments' requirements;
- Adopting American ITI advanced thermoelectric cooling technology and thermoelectric cooling components manufactured under Japanese quality controlling mode, TC-XP thermal cycler possess the stable and reliable performance;
- With speedy temperature ramping rate at the maximum of 4℃/S, TC-XP can adjust ramping rate according to different experimental requirements;
- With multiple temperature-control modes, the instrument has much stronger compatibility;
- The central processor of TC-XP Thermal Cycler can automatically distinguish block units, as well as run other relevant programs;
- With colourful extra large screen LCD and human-oriented operating interface, its operation becomes simple and clear
- It has the function of auto power off protection, and continues to complete the unfinished program after the power supply is resumed;
- Height and pressure of hot lid is adjustable so as to fit different reacting tubes on the basis of practical operating situations, in order to prevent reagents from the evaporation and pollution;
- RS232 standard interface can be connected with normal computers, so as to realize the data printout of cycling process and result, and be convenient for analysis and research.

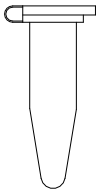
4. Operation

Adopting many advanced techniques, XP Thermal Cycler block can meet different PCR experiments' requirements. It holds a leading position in the field of similar products.

XP Thermal Cycler Adaptation Carrier:

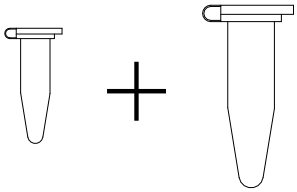
Standard Centrifuge Tube 0.2ml

TC-XP-A： 96×0.2ml
TC-XP-C： 48×0.2ml+48×0.2ml
TC-XP-G： 96×0.2ml（gradient）



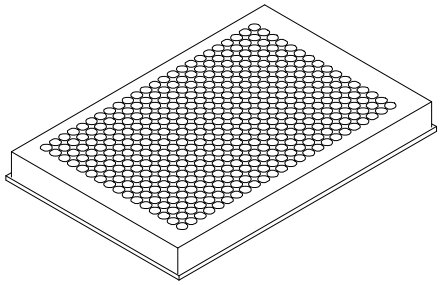
Standard Centrifuge Tube 0.5ml

TC-XP-B： 60×0.5ml
TC-XP-D： 30×0.5ml+30×0.5ml



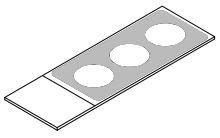
Standard Centrifuge Tube 0.2ml + Standard Centrifuge Tube 0.5ml

TC-XP-E： 48×0.2ml+30×0.5ml



384 wells plate

TC-XP-F： 384 wells plate



In Situ plate

TC-XP-H： 4 pieces of In Situ plate

CHAPTER 2 SPECIFICATIONS

This chapter describes the Thermal Cycler's operation, transportation and storage conditions, basic parameters, performance and functions.

1. Normal Working Conditions

Ambient temperature: 10℃~30℃
Relative humidity: ≤70%
Power supply: 220-240VAC，800W MAX，50-60Hz

Note: Before power-on, please check whether the above working conditions are satisfied. Pay special attention to the power line's reliable grounding.

2. Transportation and Storage Conditions

Ambient temperature: -20℃-+55℃
Relative humidity: ≤80%

3. Basic Parameters

Model	TC-XP-A	TC-XP-B	TC-XP-C	TC-XP-D	TC-XP-E	TC-XP-F	TC-XP-G	TC-XP-H
Model of Main Unit	TC-XP							
Model of Block Unit	XP-A	XP-B	XP-C	XP-D	XP-E	XP-F	XP-G	XP-H
Test-tube Volume	96×0.2ml Centrifuge tube	60×0.5ml Centrifuge tube	30×0.5ml 30×0.5ml Centrifuge tube	48×0.2ml 48×0.2ml Centrifuge tube	30×0.5ml 48×0.2ml Centrifuge tube	384 Wells plate	96×0.2ml Centrifuge tube	4pieces in situ plate
Temperature Range	4°C ~ 99°C							
Heating Rate	≥4.0°C		≥3.0°C		≥4.0°C		≥1.8°C	
Cooling Rate	≥3.0°C		≥1.8°C		≥3.0°C		≥1.8°C	
Temperature uniformity	≤0.4°C	≤0.6°C	≤0.5°C	≤0.5°C	≤0.5°C	≤0.5°C	≤0.4°C	≤0.4°C
Temperature Control Accuracy	≤0.3°C	≤0.3°C	≤0.4°C	≤0.4°C	≤0.4°C	≤0.3°C	≤0.4°C	≤0.3°C
Maximum Gradient	／	／	／	／	／	／	30°C	／

Minimum Gradient	／	／	／	／	／	／	1°C	／
Temperature set value of hot-lid	30°C ~ 110°C							／
Size（mm）	470mm×340mm×260mm（L×W×H）							
Weight（kg）	10 kg							
Fuse	250V 5A Φ5×20							
Computer Interface	RS232							

Note: When temperature set value of hot-lid is lower than that of block, the temperature of hot-lid showed in the display would be higher than the set value.

4. Performance

Maximum number of cycles：99
Maximum procedures within a cycle：16
Number of programs：99
Noise：59dB （Background Noise： below 40dB，testing on 1m dead ahead）

5. Software Functions

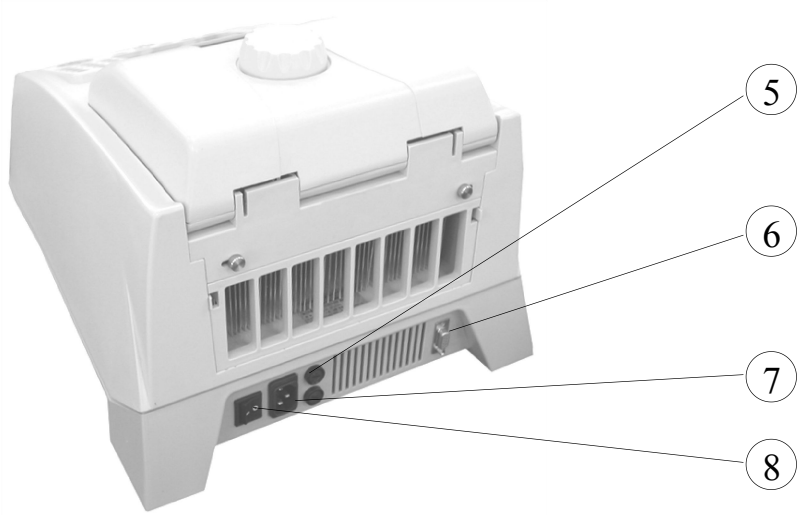
File editing and saving
File accessing, modifying and deleting
Adjusting the heating/cooling rate automatically
Automatic temperature &time increments/decrements during cycling program execution
Displaying the data at each phase of program execution instantly
Pause of program running
Stop of program running
Auto-restart in case of power failure
Soft upgrading via RS232 interface
Sound alarm
Estimating total program execution time and remaining program running time
Date and time (year, month, day, hour, minute, second) display and calibration
Failure protection and alarming

Note: The above software functions are for reference only. The Bioer Co. reserves the right to modify the software functions without notice.

CHAPTER 3 PREPARATIONS

This chapter introduces the XP Thermal Cycler's mechanical structure, the keyboard and each button's functions, and some preparations before power-on. Before any operation, please read this chapter carefully and make sure you are familiar with the steps introduced.

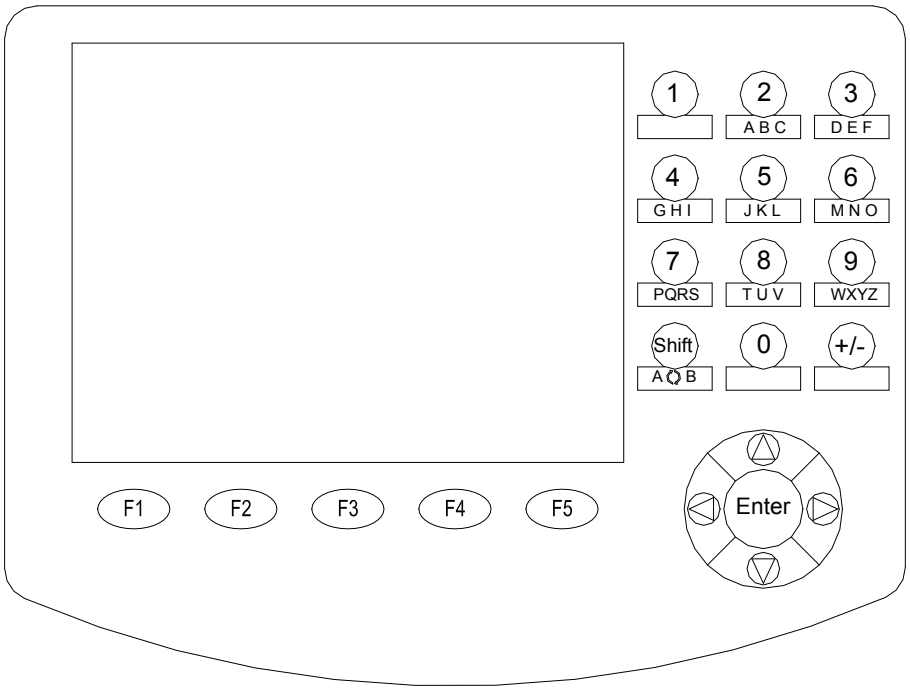
1. Structure Description



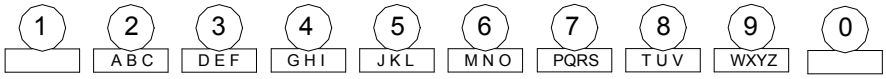
① Block	② LCD Screen	③Operating Keyboard	④ Ventilating Hole
⑤ Power Switch	⑥ Power Supply	⑦ Fuse Socket	⑧ RS232 Interface

Notes: The fuse specifications are as follows: 250V 5A, Φ5×20mm. The fuse should be replaced by one that meets those specifications. If you need certificated fuses, please contact the distributor or manufacturer.

2. Keyboard Diagram



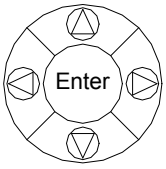
3. Introduction of pressing keys



"Digit & Letter", select the letter by pressing in succession.

"Shift"，shift from one block to another and Capital letters to small

"Function"， change "+, -" when editing process temperature and modifying time



"Right/Left"，moving the cursor one position to the left or right when pressing during file parameter setting.

"Up/Down"，moving the cursor one position to the up or down when pressing during file parameter setting.

"Enter"，press it to accept the present parameters setting displayed on the screen when setting documents.

"Menu", displaying the main menu when pressing during file editing or hot lid temperature rising process.

4. Installation of Block Unit

The main unit must link with the block unit so as to work normally. Please install or dismantle the block unit according to the following steps:

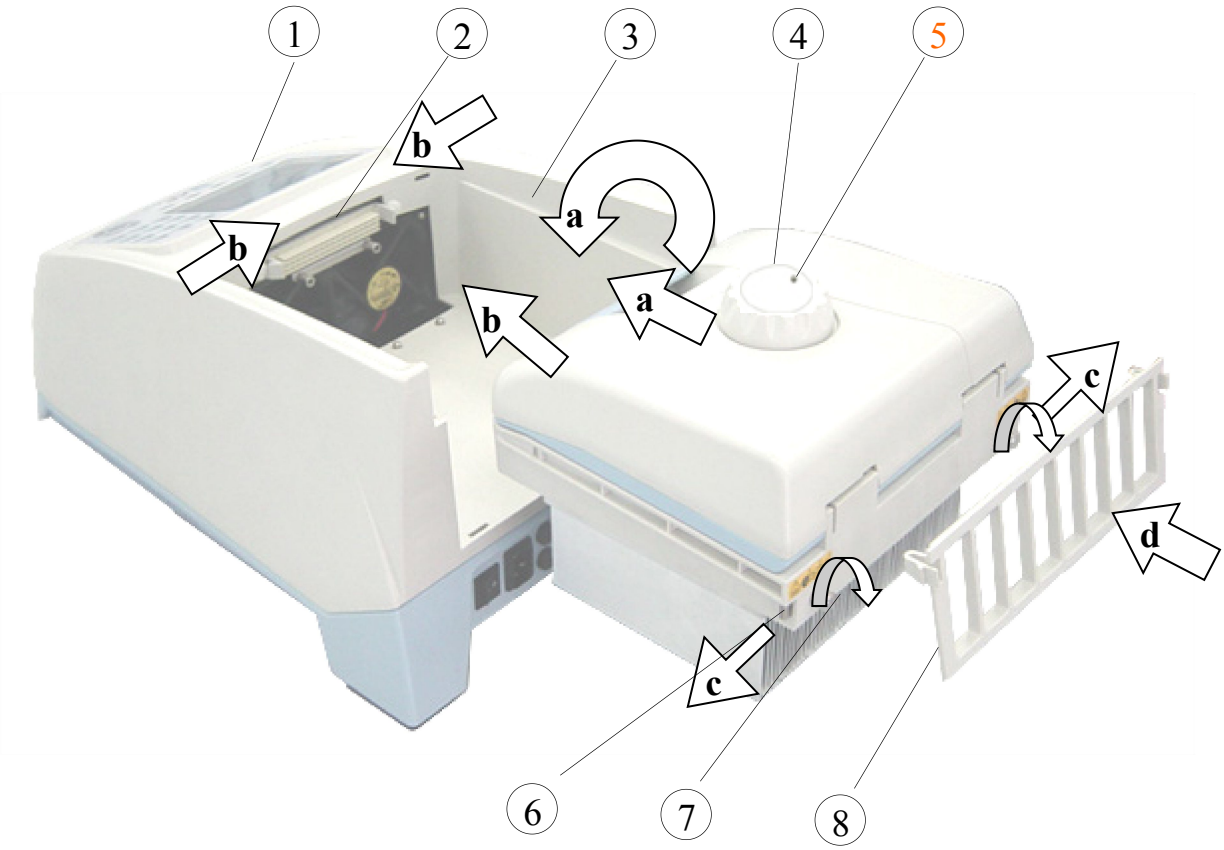
4.1 Installation

a) Before installing block, please take down the rubber protection strip, which can protect the bit from distortion during transportation, from radiator.

b) Put the block onto the block bath and push it slowly until reliable connection between block's socket and Main Unit Connecting Plug achieved, thus to close the fixed blots.

c) To close the fixed bolt and tighten its screws;

d) To install the back air-dispelling block.



① Main Unit (the base: TC-XP) ② Main Unit Connecting Plug ③ Block Bath ④ Block

⑤ Release key ⑥Fixed Bolt Screw ⑦Fixed Bolt ⑧Back Air-dispelling Block

Note：	Make sure to switch off the power supply before installing block. When install block, please pay close attention to push the block slowly; otherwise, damaged. When uninstall block, please draw the block from the block bath gently. It's forbidd connection wire. After installation, the block unit will be recognised by the main body automatically, other operation.

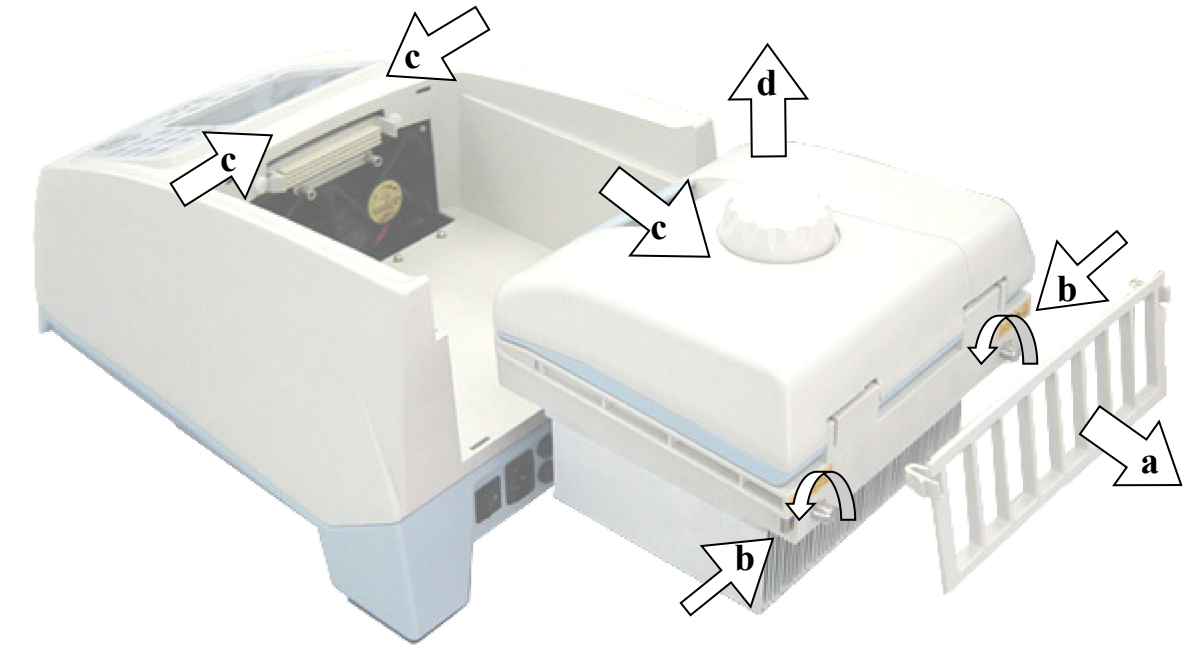
4.2 Dismantlement

a) Take down the back air-dispelling block;

b) Unscrew screws of the fixed bolt and unbolt it;

c) Please draw the block from the block bath gently. (During uninstall of block, please pay close attention to protect the main unit from moving with the block.)

d) Take out the block. The dismantlement is finished.



5. Inspection before Power-on

Before switch the power on, please ensure that:

1) Supply voltage falls within the specified limits (refer to Chapter 2);
2) The plug has been inserted into the power socket reliably;
3) The grounding of the power line is reliable.

6. Power-on Procedures

Turn on the power (i.e. turn the power switch to position "–"), the XP Thermal Cycler will beep twice, and the LCD will display **"Self testing ••••••"**. That means the device is under self-testing, which will last for about 1-2 minutes. Please wait patiently. After the self-testing, the main menu will be displayed, and the device is ready for operations such as editing, accessing, modifying, or deleting a PCR amplification file.

CHAPTER 4 OPERATION GUIDE

There are eight kinds of block units suitable to XP Thermal Cycler. In this chapter, we will explain in details on operations of every kind of block unit, for example, how to edit, access, modify, delete, or run a PCR amplification file, how to set parameters under different block unit.

Warning!	Please turn off the power immediately and contact the distributor if abnormal sound or display appears after power-on, or if failure alarm and display are found in the process of the device's self-testing.

Note:	If the number of samples is less than the number of conical holes of the block, the sample tubes should be evenly distributed over the block, in order to ensure that the heated lid will stably press on the top of the sample tubes, so that both the block's load and the temperature distribution in each tube are even.

Note:	Before closing the cover, please revolve the knob counter-clockwise according to the knob diagram till there sound "dang, dang....." Please note that the knob can be tightened by revolving clockwise, but can be loosed by revolving counter-clockwise. After closing the cover but before power on, please revolve the knob clockwise till it sound "dang,dang....." Revolve the knob one more turn. At the beginning of revolving the knob clockwise or counter-clockwise, you can hear "dang,dang...." sound,press the release key by your finger; meanwhile, revolve the knob counter-clockwise for two turns, thus to loose the release key to revolve the knob.

☺ **Are you ready? Let's begin!**

TC-XP-A
Single-block
Program

TC-XP-B
Single-block
Program

TC-XP-C
Dual-block
Program

TC-XP-D
Dual-block
Program

TC-XP-E
Dual-block
Program

TC-XP-F
Single-block
Program

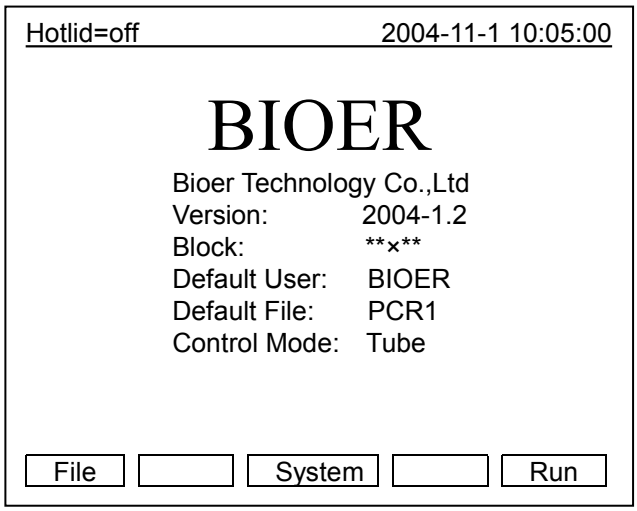
TC-XP-G
Gradient Block
Program

TC-XP-H
Single-block
Program

1. How to run a single-block PCR program

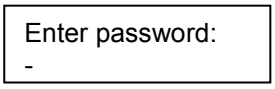
Switch the power on, XP Thermal Cycler will beep twice, and it shows the power supply is connected well. The screen will display **"Self-testing ••••••"**, and the instrument will carry on self testing. The self-testing needs about 1~ 2 minutes and please wait patiently. If the self-testing is successful, the screen will display the main interface.

Main Interface

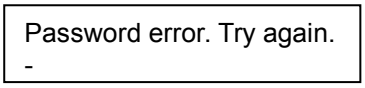


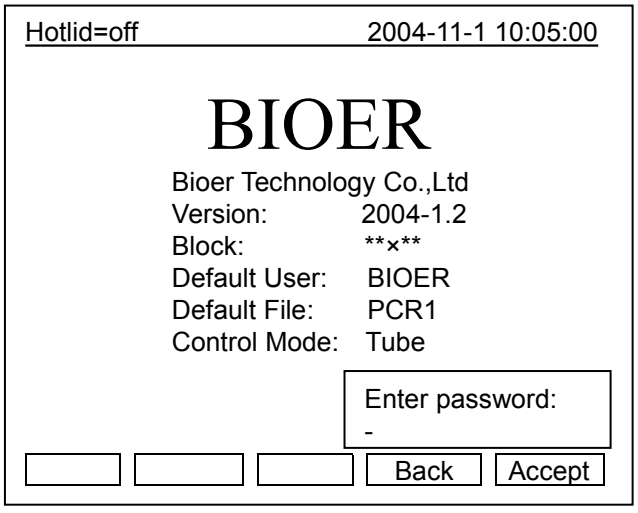
On the left top of the main interface it displays the state of Hot lid.
On the central area it displays Bioer Co. information, software version number, block model, default file, default user, control mode and sample volume.

- ✧ Press **"File"** to enter file list interface;
- ✧ Press **"System"** to enter system parameter setting interface;
- ✧ If the default file has no password, press "**Run**" to enter running mode or enter the interface displaying sample volume input window. If the default file has password, press "**Run**", thus a dialog box will be showed to indicate the user to input the password.

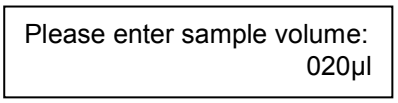


Press digtal button to enter password directly. Then, press "**Back**" to go back the main interface, press "**Accept**" to confirm the password, thus to enter file running interface or sample volume input window. If the password is wrong, there will be displayed a dialog box as below:



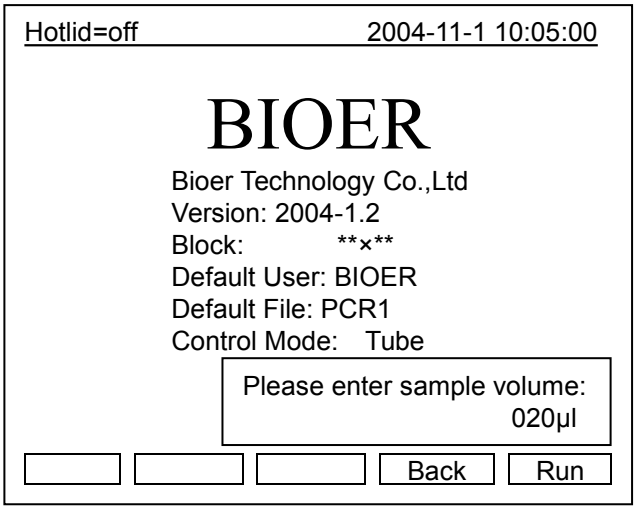


- ✧ If the current Control Mode is Block mode, press "**Accept**" button to enter file running interface. If the current Control Mode is Tube mode, press "**Accept**" button, thus there will be displayed a dialog box to indicate the user to input the sample volume.



Press **Character button** to input sample volume according to practical condition. Under Tube mode, the overshooting temperature and keeping time will be dirrerent in the case of different sample volume.

- ✧ Press "**Back**" to go back the main interface.
- ✧ Press "**Run**" to enther file running interface.

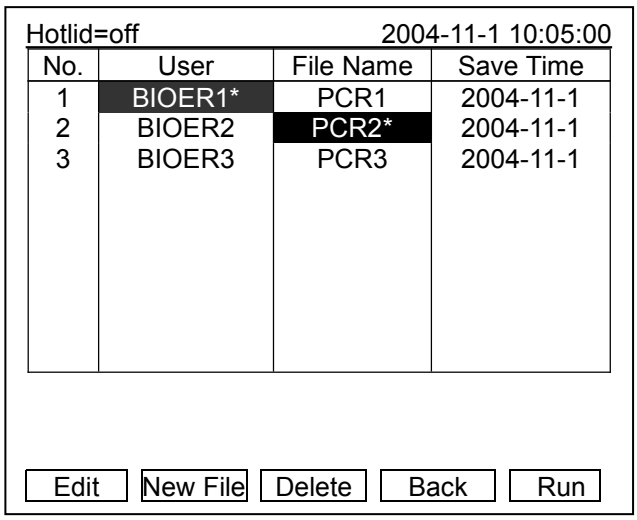


1.1 How to edit a PCR program

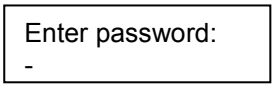
Press "**File**" on the main interface to enter file list interface. There are 3 files listed in the form as showed in the picture. When the flashing bar is flashing in the User Column, select users through pop-up key; at this time, the File Name Column will display the relative files of the selected user dynamically. Shift to the File Name Column, where the flashing bar will flash, thenselect relative user's file through pop-up key.

File List Interface

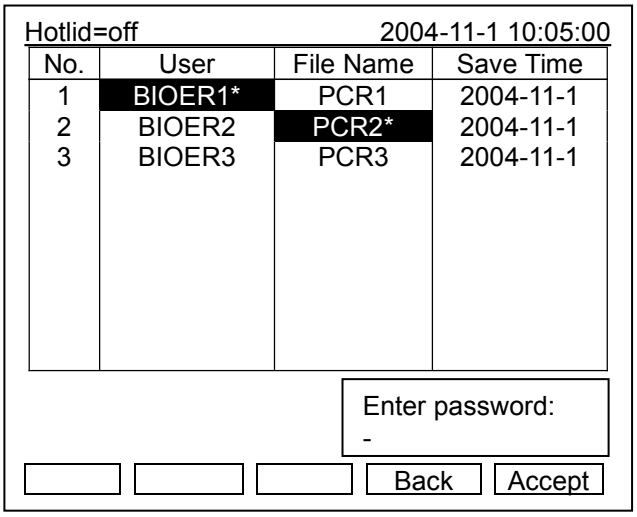
- ✧ Press "**Edit**" to edit the file indicated by the cursor.
- ✧ Press "**New File**"to edit a new file.
- ✧ Press "**Delete**" and the system will alarm "Do you want to delete the file? Please select 'F3' or 'F4'.", then according to the alert to select（Delete） or （BACK）.



✧ If the file has no passpord, press“**Edit**” to enter file editing interface; While if the file has password, press “**Edit**”, thus a dialog will be displayed to indicate the user to enter the password.



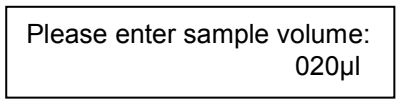
Press **Character button** in the main interface to input the password directly. Press “**Back**” to go back file list interface. Press **“Accept”** to confirm the password and then the system will enter the file editing interface,



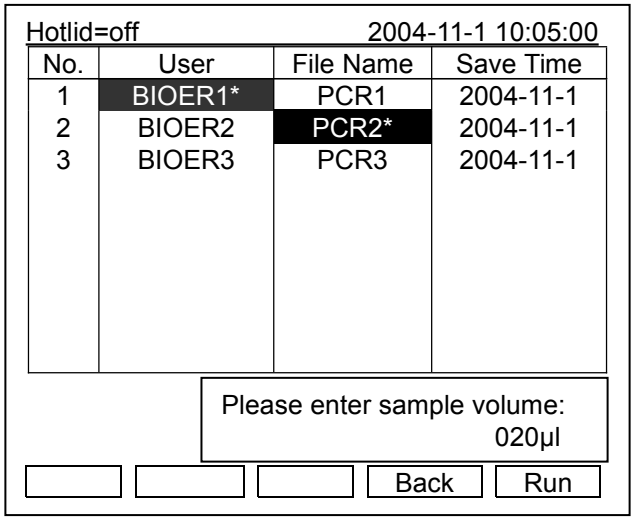
✧ If the file has no password, press “**Run**” to enter file running interface or sample volume input interface. If the file has password, press “**Run**”**,** a dialog box will be displayed for inputting the password. Press “**Back**” to go back the file list interface. Press “**Accept**” to confirm the password, and then the system will enter file running interface of sample volume input window.

Press “**Run**” in the file list interface, and input the password:

✧ If the current Control Mode is Block mode, Press “**Accept**” to enter file running interface; while if the current Control Mode is Tube mode, press “**Accept**”, thus a dialog box will be displayed for inputting sample volume.

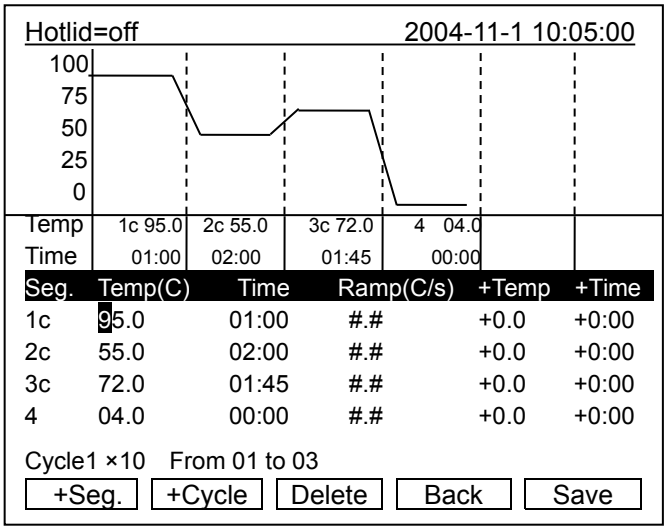


Press **Character button** to input sample volume according to practical condition. Press “**Back**” to go back file list interface. Press “**Run**” to enter file running interface.



Note: The sign“*”at the top of User and File indicates the current running file is default one, which can be modified in the parameter setting interface.

File Edit Interface



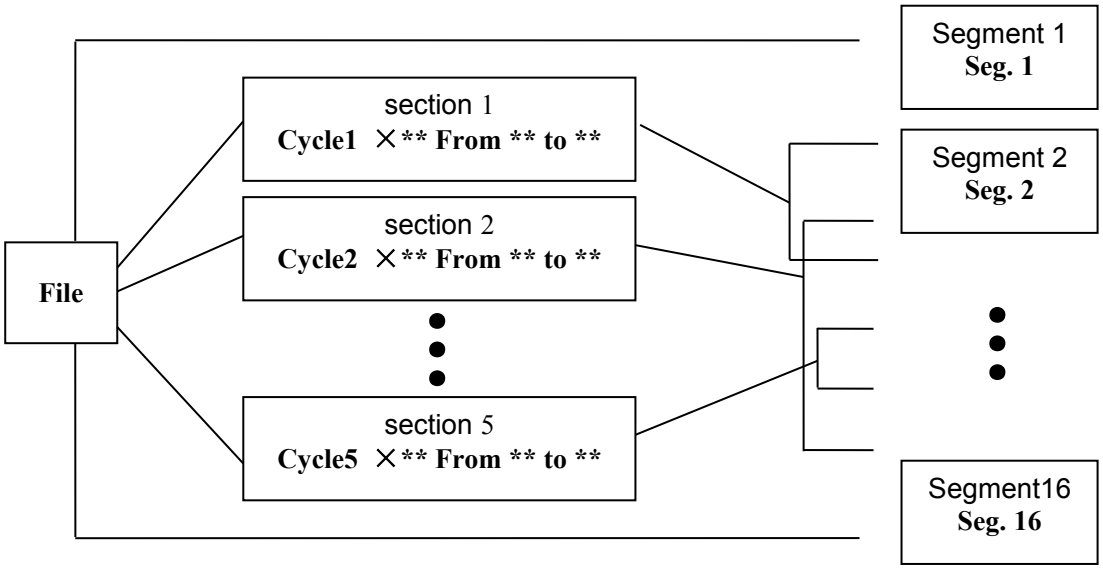
In this interface, you can edit sections and segments of the file. A file is comprised by sections and segments. And the sections contain many segments, which you can set cyclers to be run (refer to the figure). Move cursor by pressing **"Up/Down"** and "**Right/Left**", and the position that the cursor reaches will be displayed in white on a black background. Press **"Digit & Letter"** to modify parameter settings. Press **"Function"** to change +/-, but +/- before the zero cannot be modified. If it needs to go back to the main interface on midway, press **"Save"** first then press **"Main"**.

- ✧ Press "**+Seg.**" to enter segment edit interface. In every segment, you can set setting temperature (Temp.), duration (Time), Ramping rate (Ramp), temperature increment of every cycler(+Temp) and time increment of every cycler (+Time). Press **"Delete"** to delete the present segment.
- ✧ Press **"+Cycle"** to enter segment edit interface, where you can set cycle numbers and initial cycle segment. The figure shows a cycle from the first segment to the third one, and there are totally 10 times cycles.
- ✧ Press **"+Cycle"** repeatedly to add sections (max.: 5 sections). Press **"Delete"** to delete the present segment. Move cursor by pressing **"Up/Down"** to enter the former segment or the latter.
- ✧ Press **"Save"** to enter file save interface.
- ✧ Press "**Back**" to go back to File List Interface.

Special Warning:

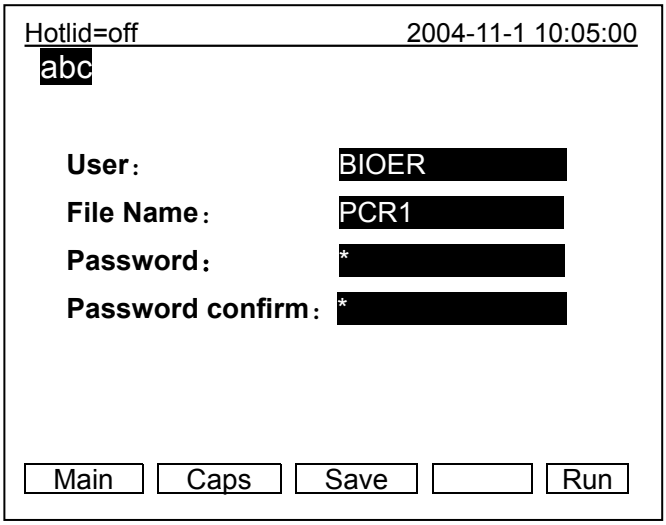
1 For the new edited PCR program, please save first then run it, otherwise the file file can't be run;

2 When setting "Time" as "--:--", the hotlid will be closed automatically when the block reaches the target temperature.



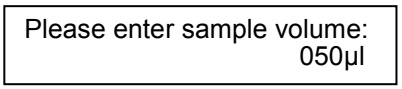
Relation of sections and segments in a file

File Save Interface

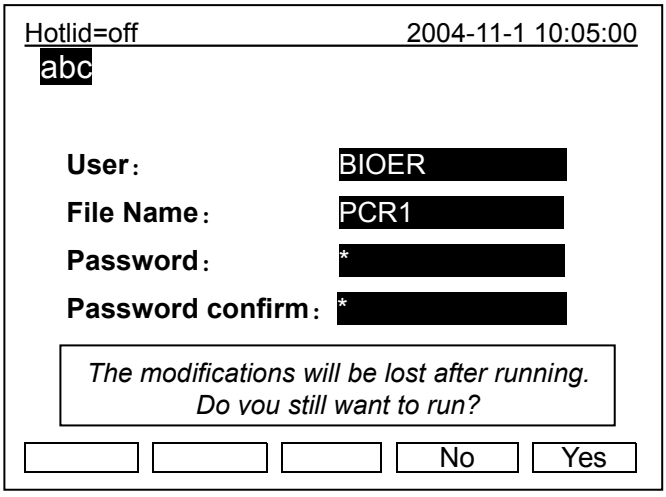


In this interface press **"Digit&Letter"** to enter the file name. Press **"enter"** to move the cursor forwards one position. Select "**User、File Name……**" through pop-up key. Click left button to delete characters while clicking right button to move the cursor.

- ✧ Press **"Main"** to go back to the main interface.
- ✧ Press **"Caps key"** to shift the capital or small letter, and there will be a capital or small letter indication on the left top of the screen. (as the example: abc)
- ✧ Press **"Save"** to save the file. When the file is normally saved, the system will remind "File have been saved. Please continue another operation", Press **"Enter"** to cancel the reminding bar. If the file was used, the system will remind you to rename (Rename) or continue to save (Save).
- ✧ If the current Control Mode is Block mode, press "**Run**" to enter file running interface; if the current Control Mode is Tube mode, press "**Run**", thus a dialog box for indicating to input sample volume will be displayed.

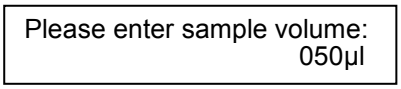


Press **Character button** to input sample volume according to practical condition. Press "Back" to go back file save interface. Press "Run" to enter file running interface.



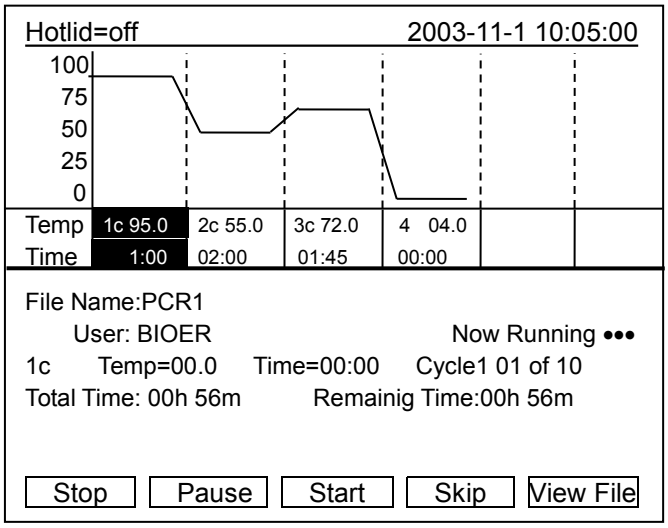
Enther the file save interface,if the user press "**Run**" without pressing "**Save**", the system will remind "The modifications will be lost after running. Do you still want to run?"

- ✧ Press "**No**" to go back file save interface.
- ✧ Press "**Yes**" to enter file running interface and sample volume input interface. (Note: the modification here cannot be saved after the program is running over.)
- ✧ Press "**Yes**", if the current Control Mode is Block mode, the program will enter file running interface; if the current Control Mode is Tube mode, the system will pop up a dialog box of sample volume input:



Press **Character button** to input sample volume according to practical condition. Press "Back" to go back file list interface. Press "Run" to enter file running interface.

File running interface

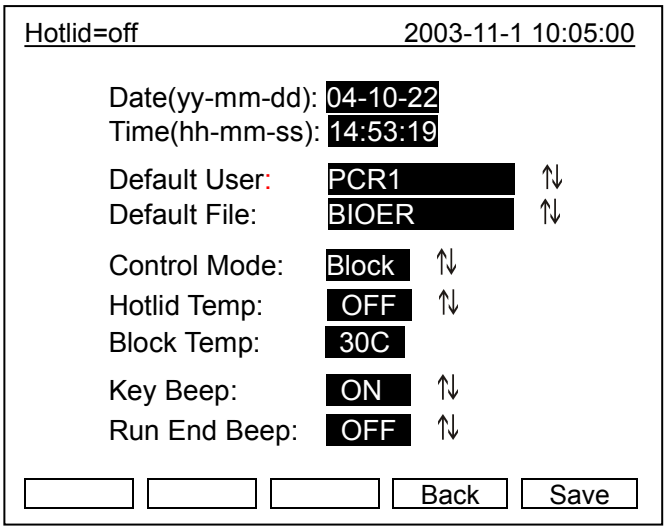


When the file is normally running, "•••" at "Now Running" will continuously flash. When running is over, the system will remind "File running is over ,Press 'Enter' back to the main interface".

- ✧ Press "**Stop**" and it will remind "Do you want to stop running? Please select 'F1'or 'F3'.". According to the reminding information to select "STOP" or "START".
- ✧ Press "**Pause**" and it will remind "Pause state now. Press 'F3' to continue running." According to the reminding information you can select "START" to continue.
- ✧ Press "**View File**" to view edited PCR programs.
- ✧ Press "**Skip**" to stop current temperature and run the next.

1.2 How to set system parameters

System Parameter Setting Interface



In the main interface press "**System**" to enter system parameter setting interface. Press "**Enter"** to move the cursor to next item. The option is followed by the symbol "⇅". Press "**Up/Down**"to roll the option for selecting, and other information can be entered by pressing "**Digit&Letter**". Press "**Right/Left**" to move cursor's position.

- ✧ Press "**Back**" to go back to the main menu.
- ✧ Press "**Save**" to save parameters.

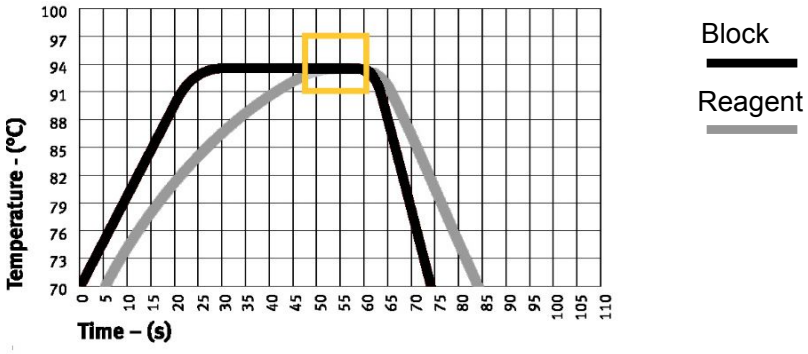
Special Reminding: When set the parameter, please press the "Save", otherwise the parameter remains the original one.

1.2.1 "Date"and"Time"stand for default time after power-on.

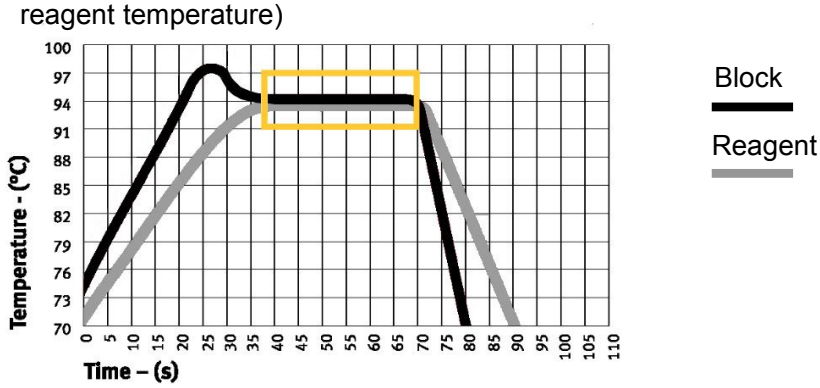
1.2.2 "Default File" and "Default User" stand for name and user of default running procedure after power-on.

1.2.3 "Control Mode" stands for default control model after power-on., including two optional modes , named "Block" and "Tube".

"Block" mode subjects to simple temperature control during the course of cooling & heating only. Compared to the block, cooling & heating rate of reagent is a little slower, therefore, the actual change of reagent's temperature is different from the setting procedure. The actual time for reagent to reach & keep the setting temperature is far shorter than the setting time. (Please refer to the following figure: relation between block temperature and reagent temperature)



"Tube mode" has considered the phenomenon that the cooling & heating rate is a little slower than that of block. There is an overshoot after reaching the setting temperature, which can allow reagent to reach the setting temperature faster. During the same setting time as "Block", the actual time for reagent to keep the setting temperature is prolonged obviously. (Please refer to the following figure: relation between block temperature and reagent temperature)



1.2.4 "Hotlid Temp": means hotlid's state "on/off", the target temperature of hotlid (can be input directly).

1.2.5 "Block Temp": means the hotlid is heating, the costant temperature of block. This function is available only when the hotlid is under "on" state.

1.2.6 "Key Beep", "Run End Beep" stand for the sound of pressing key and reminding sound after the procedure runs over respectively.

See details in the APPENDIX 2.

NOTE:

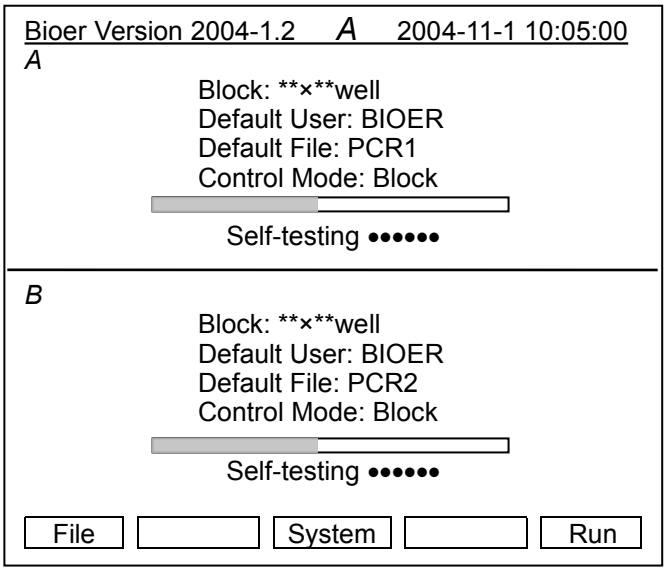
1. After set the parameters, please press "Save" to confirm the setting, otherwise the parameter remains the original one.
2. Before the instrument leaves the factory, its inside clock has been adjusted in accordance with Beijing Time.
3. For the first use of the instrument, you are advised to confirm whether the date and clock time are set right as local time.

2. How to run a double- block PCR program

Switch the power on, XP Thermal Cycler will beep twice, and it shows the power supply is connected well. The screen will display **"Self testing ••••••"**， and the instrument will carry on self testing. The self-testing needs about 1~2 minutes, and please wait patiently. If the self-testing is successful, the screen will display the main interface.

Dual block means two blocks: Block A and B respectively represent actual block on the left and right. Press "Shift" to operate A or B blocks in the same interface. The following introduction takes the example of operating A block.

Main Interface

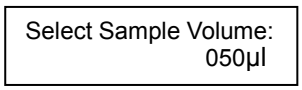


In the top center of the main interface, it blinking displays the present operating block. As in the illustration it shows the control symbol is "A". Press "Shift" to change control symbol.

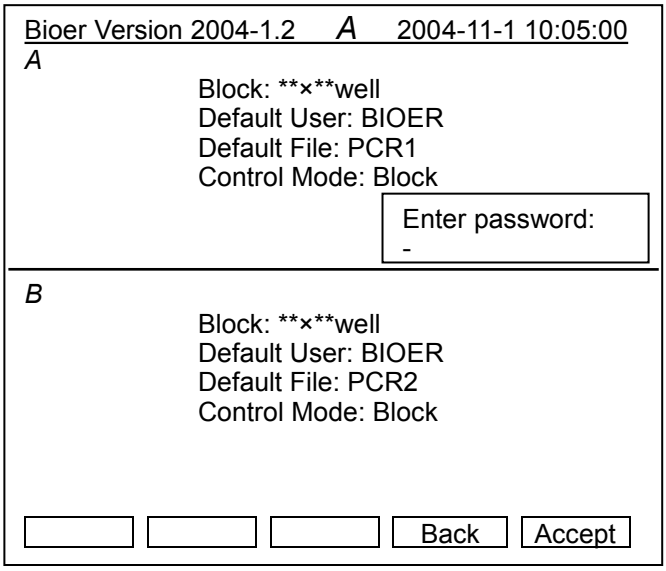
In the central area of the main interface it displays the types of A & B blocks, default file, default user, control mode and sample volume.

- ✧ Press **"File"** to enter file list interface.
- ✧ Press **"System"** to enter system parameter setting interface.

- ✧ If the file has no password, press "**Run**" to enter file running interface or sample volume input interface. If the file has password, press "**Run**", a dialog box will be displayed for inputting the password. Press "**Back**" to go back the file list interface. Press "**Accept**" to confirm the password, and then the system will enter file running interface of sample volume input window.



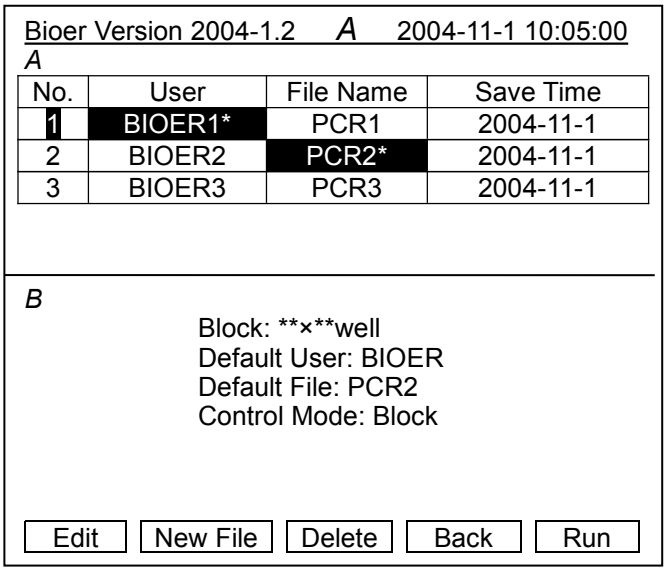
Press **Character button** to input sample volume according to practical condition. Press "Back" to go back file list interface. Press "Run" to enter file running interface.



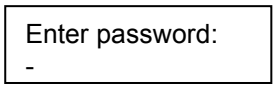
2.1 How to edit a PCR program

In the main interface press **"File"** to enter file list interface There are 3 files listed in the form as showed in the picture. When the flashing bar is flashing in the User Column, select users through pop-up key; at this time, the File Name Column will display the relative files of the selected user dynamically. Shift to the File Name Column, where the flashing bar will flash, then select relative user's file through pop-up key:

File List Interface

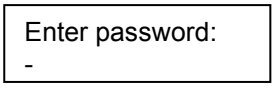


- ✧ If the file has no password, press "**Edit**" to enter file edit interface; if the file has password, press "**Edit**", the system will poop up a dialog box for inputting password.

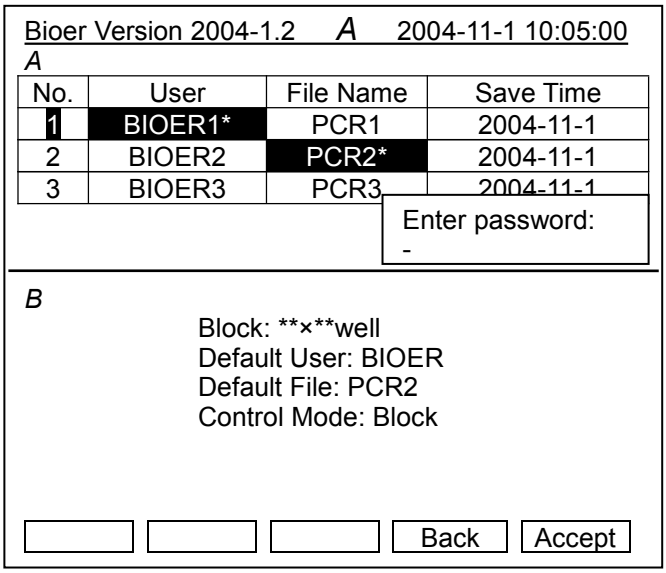


Press Digital buttom to input password directly. Press "Back" to go back the file edit interface. Press "Accept" to confirm the password, and the system will enter file edit interface. If the password is wrong, the system will pop up a reminding dialog box.

- ✧ Press **"New File"** to edit a new file.
- ✧ Press "**Delete**" and the system will alarm "Do you want to delete the file? Please select 'F3' or 'F4'.", then according to the alert information to select (Delete) or (BACK).
- ✧ Press **"Back"** to go back to the main interface.
- ✧ If the current Control Mode is Block Mode, press "**Run**" to enter into File Running Interface; while if the current Control Mode is Tube Mode, press "**Run**", the system will pop up a dialog box for inputting password.



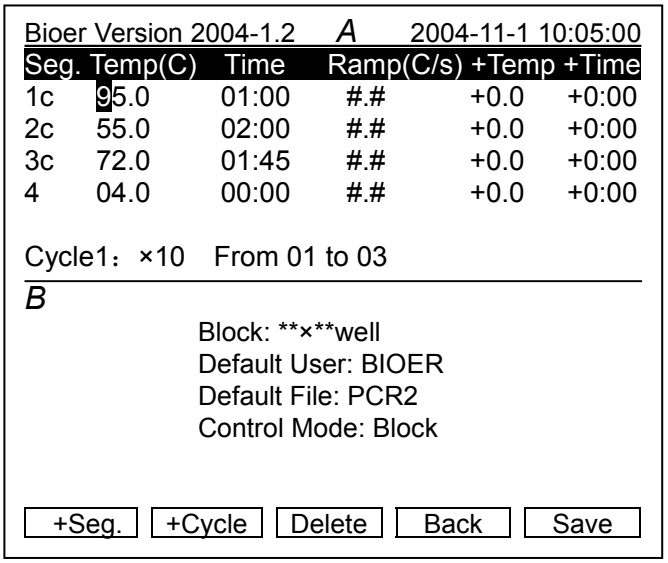
Press Digital button to input password directly. Press "Back" to go back file edit interface. Press "Accept" to confirm the password, the system will enter file running interface or sample volume input interface. If the password is wrong, the system will pop up a reminding dialog box.



Note: The sign"*"at the top of User and File indicates the current running file is default one, which can be modified in the parameter setting interface.

File Edit Interface

In this interface move cursor by pressing **"Up/Down"** and "**Right/Left**", and the position that the cursor reaches will be displayed in white on a black background. Press Digit & Letter to modify parameter settings. Press Function to change "+/-", but "+/-" before the zero cannot be modified If it needs to go back to the main interface on midway, press **"Save"** first then press **"Main"**.


Bioer Version 2004-1.2 A 2004-11-1 10:05:00
Seg. Temp(C) Time Ramp(C/s) +Temp +Time
1c 95.0 01:00 #.# +0.0 +0:00
2c 55.0 02:00 #.# +0.0 +0:00
3c 72.0 01:45 #.# +0.0 +0:00
4 04.0 00:00 #.# +0.0 +0:00
Cycle1：×10 From 01 to 03
B
Block: **×**well
Default User: BIOER
Default File: PCR2
Control Mode: Block
+Seg. +Cycle Delete Back Save

- ✧ Press "**+Seg.**" to enter segment edit interface. In every segment, you can set setting temperature (Temp.), duration (Time), Ramping rate (Ramp), temperature increment of every cycler (+Temp) and time increment of every cycler (+Time). Press **"Delete"** to delete the present segment.
- ✧ Press **"+Cycle"** to enter segment edit interface, where you can set cycle numbers and initial cycle segment. The figure shows a cycle from the first segment to the third one, and there are totally 10 times cycles.
- ✧ Press **"+Cycle"** repeatedly to add sections (max.: 5 sections). Press **"Delete"** to delete the present segment. Move cursor by pressing **"Up/Down"**to enter the former segment or the latter.
- ✧ Press **"Save"** to enter file save interface.
- ✧ Press "**Back**" to go back to File List Interface.

Special Warning:

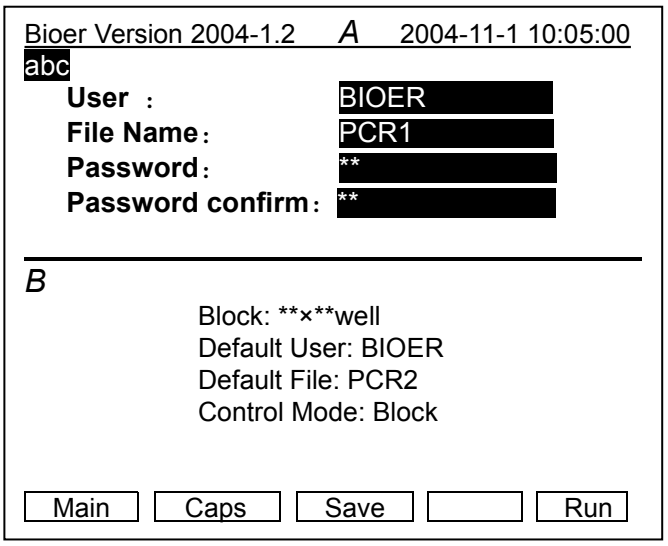
1 For the new edited PCR program, please save first then run it, otherwise the file File cannot be run.

2 When setting "Time" as **"--:--"**, the hotlid will be closed automatically when the block reaches the target temperature.

File Save Interface

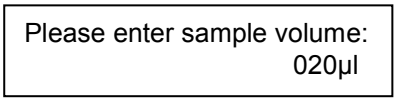
In this interface press Digit & Letter to enter the file name. Press "**Enter**" to move the cursor forwards one position. Select "**User、File Name……**" through pop-up key. Click left button to delete characters while clicking right button to move the cursor.

- ✧ Press **"Main"** to go back to the main interface.
- ✧ Press "**Caps**" to shift the capital or small letter, and there will be a capital or small letter indication on the left top of the screen. (As the example: abc)
- ✧ Press **"Save"** to save the file. When the file is normally saved, the system will remind "File have been saved. Please continue another operation",

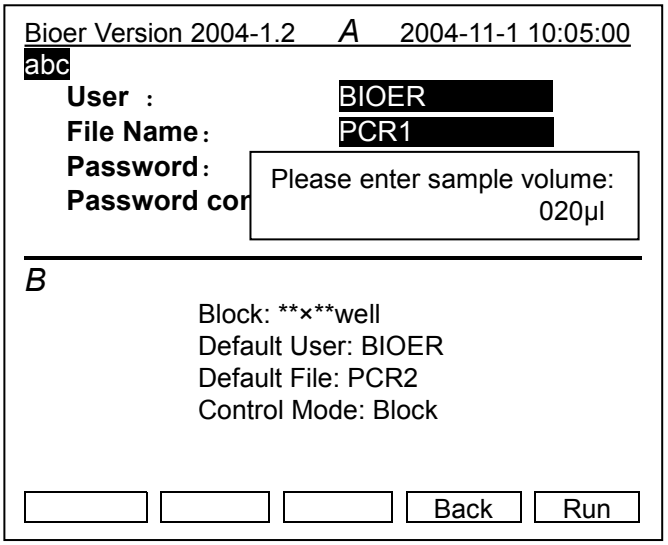


Press enter key to cancel the reminding bar. If the file was used, the system will remind you to rename （Rename） or continue to save (Save).

✧ If the current Control Mode is Block mode, press “Run” to enter the file running interface. If the current Control Mode is Tube mode, press “Run”, thus the system will pop up a dialog box as below:



Press **Character button** to input sample volume according to practical condition. Press “Back” to go back file list interface. Press “Run” to enter file running interface.

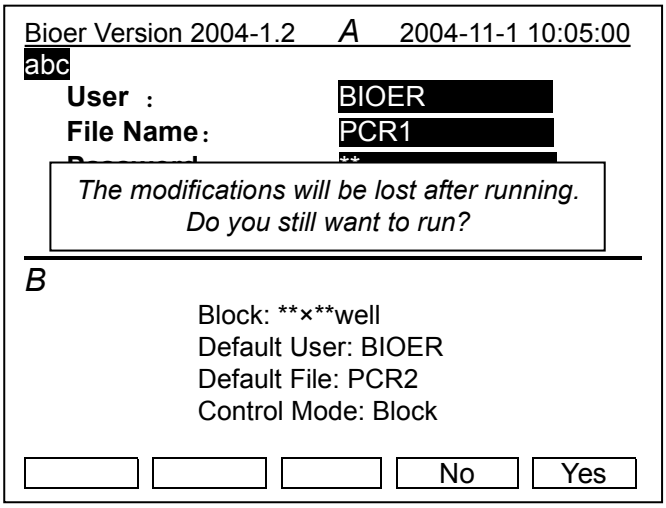


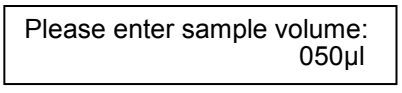
Enter the file save interface. If press “Run” directly without pressing “Save”, the system will remind: “The modifications will be lost after running. Do you still want to run?”

✧ Press “No” to go back file save interface.

✧ Press “Yes” to enter file running interface and sample volume input interface. (Note: the modification cannot be saved after the program is running over.)

✧ Press “Yes”, the program will enter file running interface if the current Control Mode is Block mode; if the current Control Mode is Tube mode, the system will pop up a dialog box as below:



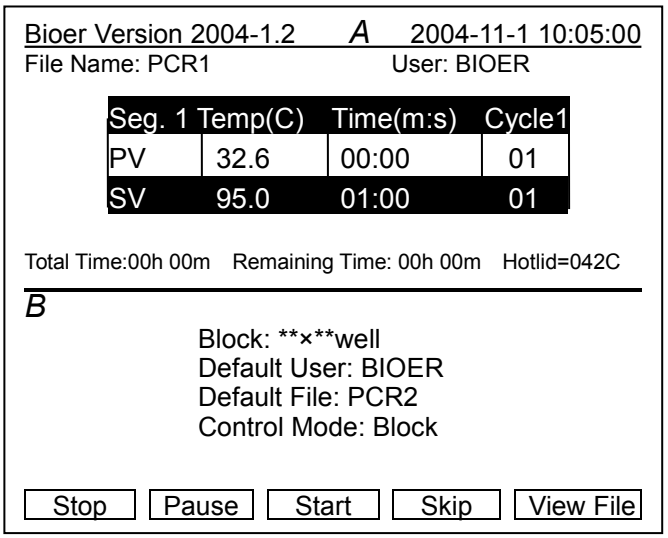


Press **Character button** to input sample volume according to practical condition. Press “Back” to go back file list interface. Press “Run” to enter file running interface.

When the files' running is over, the system will alarm "File running is over. Press 'Enter' back to the main interface.".

- ✧ Press "**Stop**" and it will remind "Do you want to stop running? Please select 'F1' or 'F3'.".According to the reminding information to select "STOP" or "START".
- ✧ Press "**Pause**" and it will remind "Pause state now. Press 'F3' to continue running." According to the reminding information you can select "START" to continue.
- ✧ Press "**View File**" to view edited PCR programs.
- ✧ Press "**Skip**" to stop current temperature and run the next.

File Running Interface



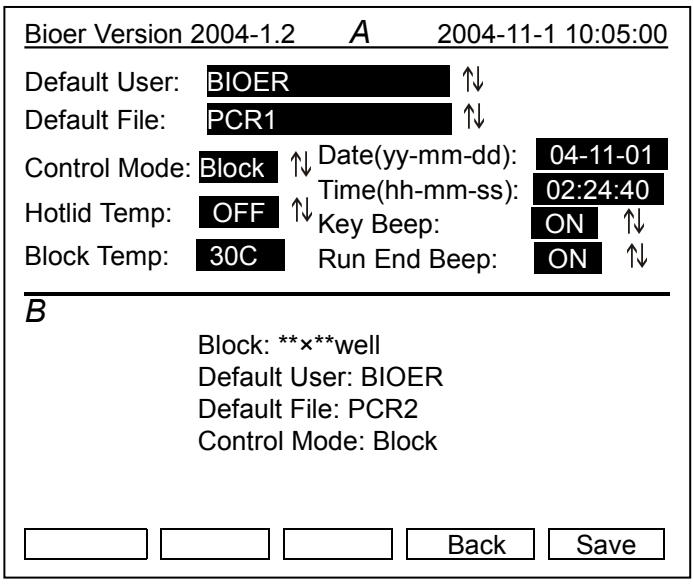
2.2 How to set system parameters

In the main interface press "**System**" to enter system parameter setting interface. Press **Enter"** to move the cursor to next item. The option is followed by the symbol "⇅". Press **"Up/Down"** to roll the option for selecting, and other information can be entered information by pressing **"Digit&Letter"**. Press **"Right/Left"** to move cursor's position.

- ✧ Press "**Back**" to go back to the main menu.
- ✧ Press "**Save**" to save parameters.

Special Reminding: When set the parameter, please press the "Save", otherwise the parameter remains the original one.

System Parameter Setting Interface



NOTE:

1.After set the parameters, please press "Save" to confirm setting, otherwise the parameter remains the original one

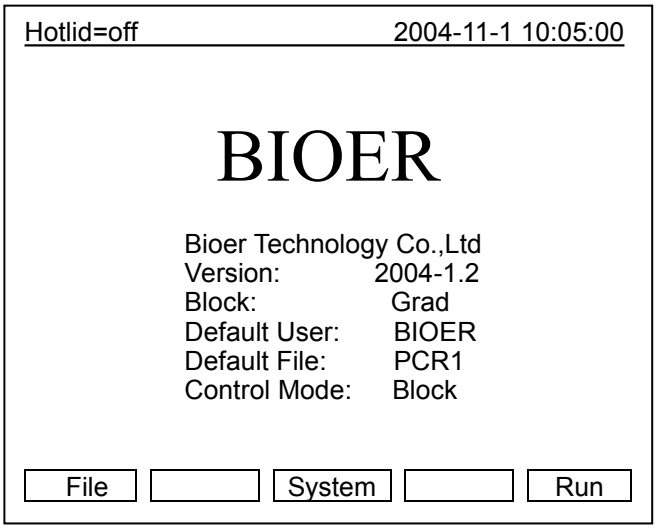
2.Before the instrument leaves the factory, its inside clock has been adjusted in accordance with Beijing Time

For the first use of the instrument, you are advised to confirm whether the date and clock time are set right as local time.

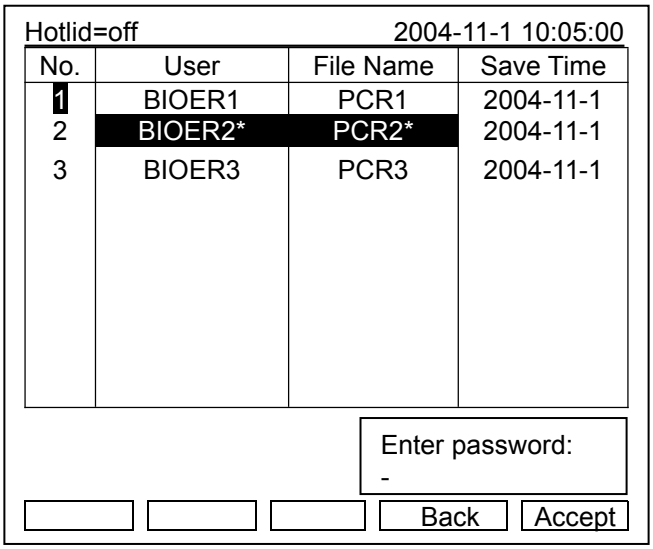
3. How to run a gradient block PCR program

Switch the power on, XP Thermal Cycler will beep twice, and it shows the power supply is connected well. The screen will display **"Self-testing ••••••"**, and the instrument will carry on self testing. The self-testing needs about 1~2 minutes, and please wait patiently. If the self-testing is successful, the screen will display the main interface.

On the left top of the main interface it displays the state of Hotlid. On the central area it displays Bioer Co. information, software version number, block type, default file, default user, control mode and sample volume.



- ✧ Press "**File**" to enter file list interface
- ✧ Press "**System**" to enter system parameter setting interface
- ✧ If the current default file has no password, press "**Run**" to enter running mode and samle volume input interface. If the current default file has password, press "**Run**" , thus the system will pop up a dialog box for inputting password.



Enter password:
-

Press Digital Button to input password directly. Press "Back" to go back the main interface. Press "Accept" to confirm the password, and the system will enter the file running interface or sample volume input interface. If the password is wrong, the system will pop up a dialog box as below:

Password error. Try again.
-

- ✧ If the current Control Mode is Block mode, press "**Accept**" button to enter file running interface. If the current Control Mode is Tube mode, press "**Accept**" button, thus there will be displayed a dialog box to indicate the user to input the sample volume.

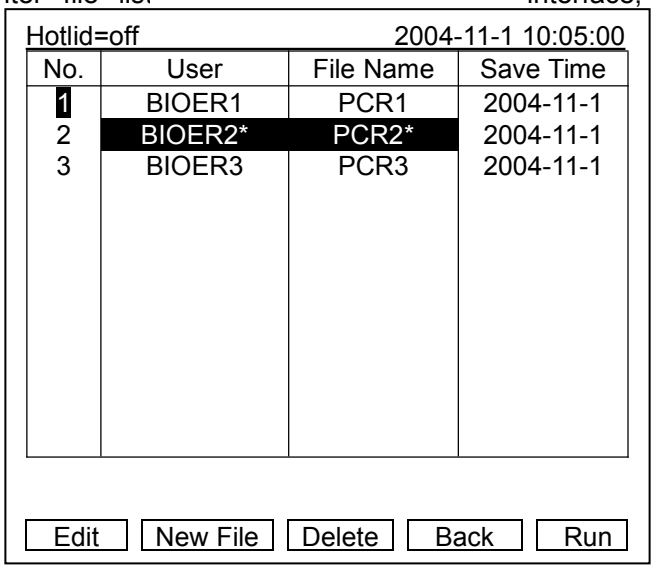
Please enter sample volume:
020μl

Press **Character button** to input sample volume according to practical condition. Press"**Back**" to go back the main interface.Press "**Run**" to enther file running interface.

3.1 How to edit a PCR program

Press **"File"** on the main interface to enter file list interface, There are 3 files listed in the form as showed in the picture. When the flashing bar is flashing in the User Column, select users through pop-up key; at this time, the File Name Column will display the relative files of the selected user dynamically. Shift to the File Name Column, where the flashing bar will flash, then select relative user's file through pop-up key.

File List Interface



- ✧ If the file has no password, press "Edit" to enter file edit interface.If the file has password, press "Edit", the system will pop up a dialog box as below:

  Enter password:
  -

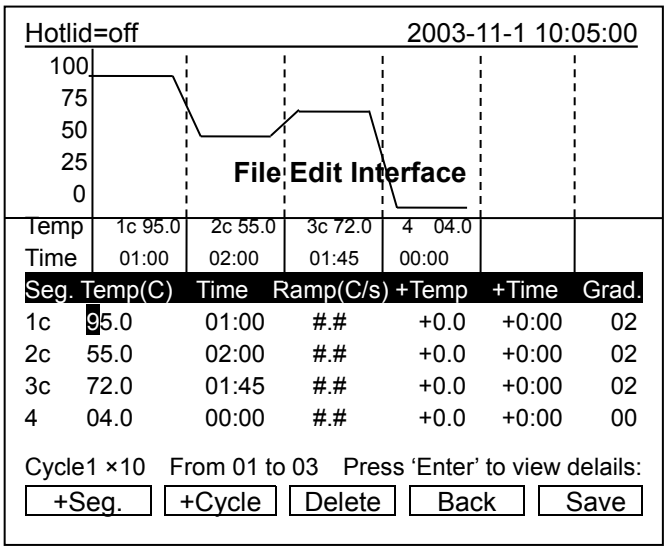
  Press Digital Button to input password directly. Press "Back" to go back file edit interface. Press "Accept" to confirm the password, the system will enter file edit interface. If the password is wrong, the system will pop up a reminding dialog box.
- ✧ Press"**New File**"to edit a new file.
- ✧ Press"**Delete**" and the system will alarm "Do you want to delete the file? Please select 'F3' or 'F4'.", then according to alert to select (Delete） or (BACK).
- ✧ Press "**Back**" to go back to the main interface.
- ✧ If the file has no password, press "Run" to enter file running interface or sample volume input interface. If the file has password, press "Run", the system will pop up a dialog box as below:

  Enter password:
  -

  Press Digital Button to input password directly. Press "Back" to go back file edit interface. Press "Accept" to confirm the password, the system will enter file running interface or sample volume input interface. If the password is wrong, the system will pop up a reminding dialog box.

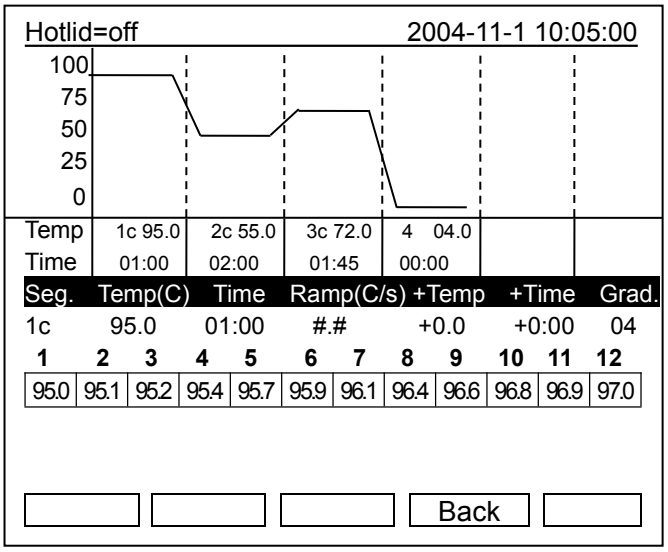
Note: The sign"*"at the top of User and File indicates the current running file is default one, which can be modified in the parameter setting interface.

In this interface move cursor by pressing



"Up/Down" and "**Right/Left**", and the position that the cursor reaches will be displayed in white on a black background. Press **"Digit&Letter"** to modify parameter settings. Press **"Function"** to change +/-, but +/- before the zero cannot be modified. If it needs to go back to the main interface on midway, press **"Save"** first then press **"Main"**.

- ✧ Press "**+Seg.**" to enter segment edit interface. In every segment, you can set setting temperature (Temp.), duration (Time), Ramping rate (Ramp), temperature increment of every cycler(+Temp) and time increment of every cycler (+Time). Press **"Delete"** to delete the present segment.
- ✧ Press **"+Cycle"** to enter segment edit interface, where you can set cycle numbers and initial cycle segment. The figure shows a cycle from the first segment to the third one, and there are totally 10 times cycles.
- ✧ Press **"+Cycle"** repeatedly to add sections (max.: 5 sections). Press **"Delete"** to delete the present segment. Move cursor by pressing **"Up/Down"**to enter the former segment or the latter.
- ✧ Press **"Save"** to enter file save interface.
- ✧ Press "**Enter**" to check detailed gradient distributing situation. (There will be no response if the Grad is 00.) Please refer to the following picture
- ✧ Press **"Back"** to enter file run interface.

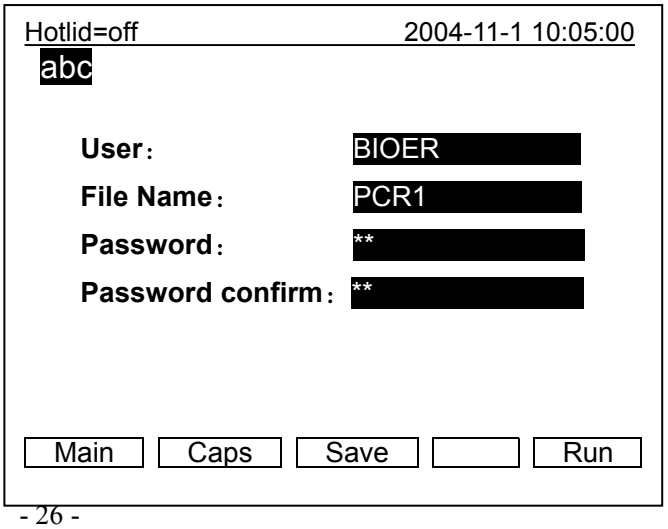


Special Warning:

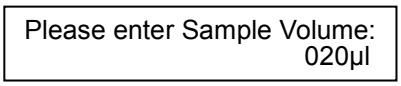
1. For the new edited PCR program, please save first then run it, otherwise the file cannot be run.
2. When setting "Time" as "--:--", the hotlid will be closed automatically when the block reaches the target temperature.
3. Set the timer as "--:--" for infinity：Press "+/-".
4. If the sample needs to be kept in instrument overnight , please set the temperature at 8~10℃.

File Save Interface

In this interface press **"Right/Left"** to enter the file name. Press "**enter"** to move the cursor forwards one position. Select User and File Name through pop-up key. Click left button to delete characters while clicking right button to move the cursor. Press "**Caps**" to shift the capital or small letter, and there will be a capital or small letter indication on the left top of the screen (as the example: abc)

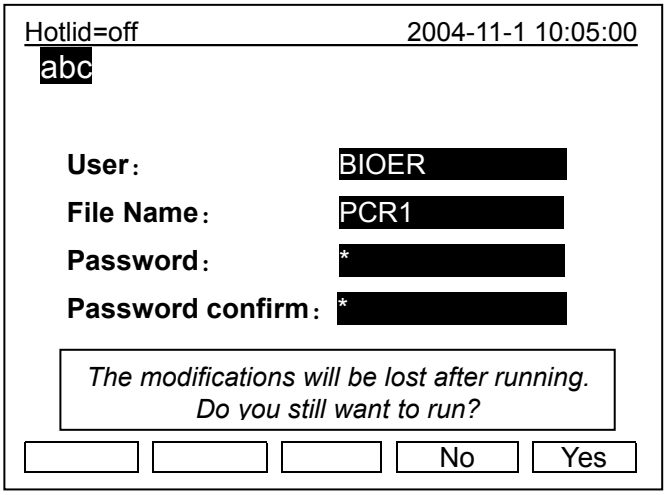


- ✧ Press “**Main**” to go back to the main interface.
- ✧ Press “**Save**” to save the file. When the file is normally saved, the system will remind “File have been saved. Please continue another operation”, Press “**Enter**” to cancel the reminding bar. If the file was used, the system will remind you to rename （Rename） or continue to save (Save).
- ✧ If the current Control Mode is Block Mode, press “Run” to enter into File Running Interface; while if the current Control Mode is Tube Mode, press “Run”, thus there appears a dialog box:

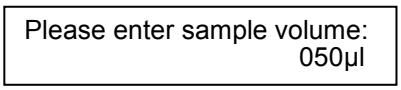


Press **Character button** to input sample volume according to practical condition. Press “**Back**” to go back the main interface. Press “**Run**” to enther file running interface.

Enter file save interface, if the user press “Run” directly without press “Save”, the system will remind:“The modifications will be lost after running. Do you still want to run?”



- ✧ Press “No”to go back file save interface.
- ✧ Press “Yes” to enter file running interface or sample volume input interface. （Note: the modification cannot be saved after the program is runnig over.）
- ✧ Press “Yes”, the system will enter file running interface if the current Control Mode is Block mode. If the current Control Mode is Tube mode, the system will pop up a dialog box for inputting sample volume.

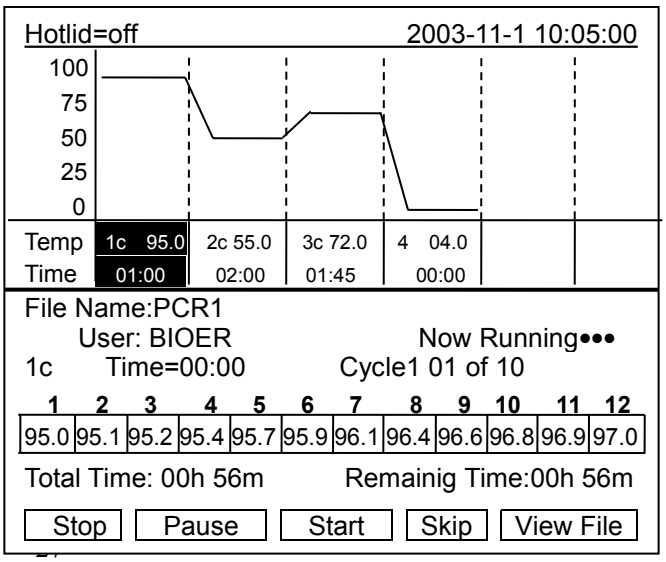


Press **Character button** to input sample volume according to practical condition. Press “**Back**” to go back the main interface. Press “**Run**” to enther file running interface.

File Running Interface

When the file is normally running, “•••” at “Now Running” will continuously flash. When running is over, the system will remind “File run over”.

- ✧ Press “**Stop**” and it will remind “Do you want to stop running? Please select ‘F1’ or ‘F3’.”. According to the reminding information to select “STOP” or “START”.
- ✧ Press “**Pause**” and it will remind “Pause state now. Press‘F3’ to continue running.” According to the



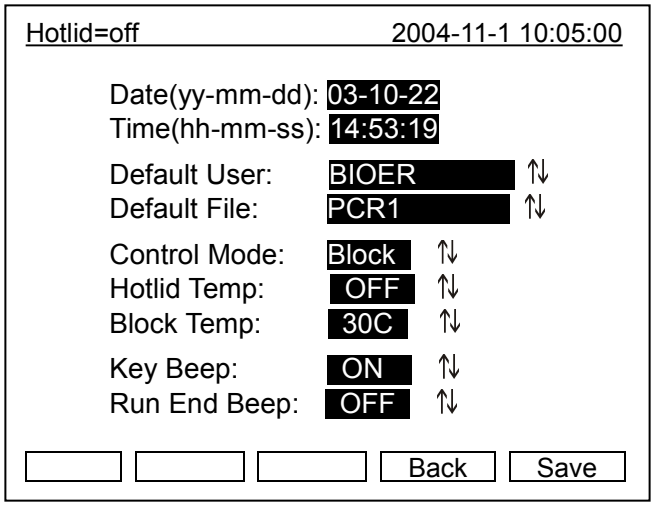
reminding information you can select “START” to continue.
- ✧ Press “**View File**” to view edited PCR programs.
- ✧ Press “**Skip**” to stop current temperature and run the next.

3.2 How to set system parameters

In the main interface press “**System**” to enter system parameter setting interface.
Press **“Enter”** to move the cursor to next item. The option is followed by the symbol “⇅”. Press **“Up/Down”** to roll the option for selecting, and other information can be entered information by pressing **“Digit & Letter”**. Press **“Right/Left”** to move cursor’s position.
- ✧ Press “**Back**” to go back to the main menu.
- ✧ Press “**Save**” to save parameters.

Special Reminding: When set the parameter please press the “Save”, otherwise the parameter remains the original one.

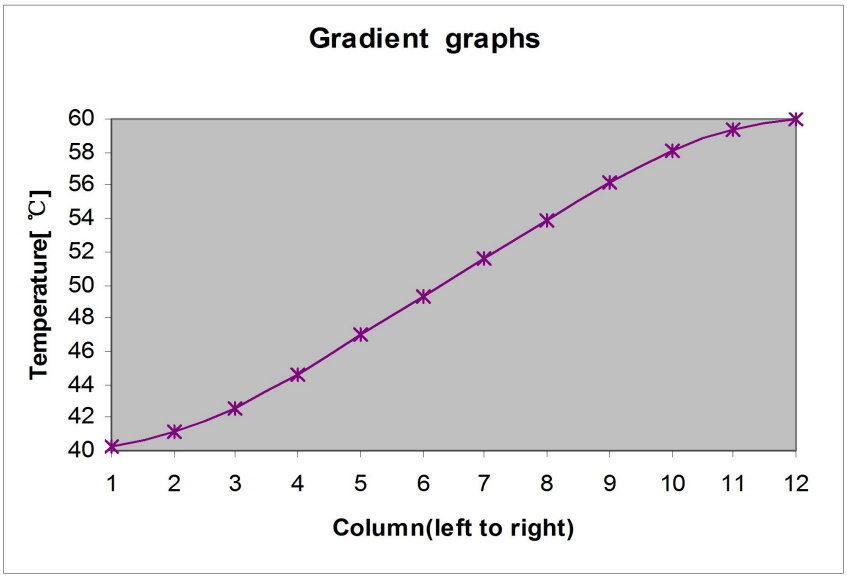
System Parameter Setting Interface



NOTE：
1.After set the parameter, please press “Save” to confirm setting, otherwise the parameter remains the original one
2.Before the instrument leaves the factory, its inside clock has been adjusted in accordance with Beijing Time
For the first use of the instrument, you are advised to confirm whether the date and clock time are set right as local time.

3.3 Characteristics of temperature distributing of gradient block

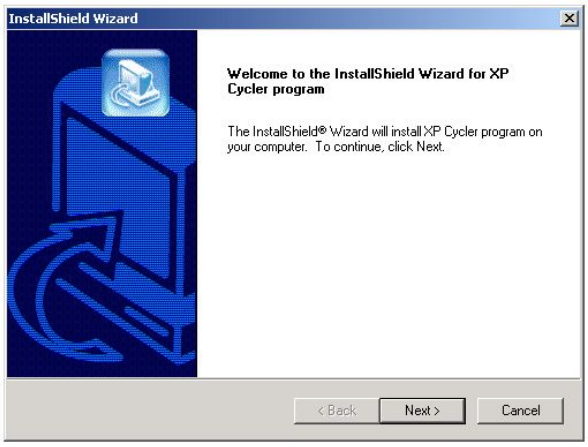
The gradient block adopts 3-group temperature control units, so that the gradient temperature appears curve distribution as showed in the following figure (Setting temp is 40℃, and gradient setting temp is 20℃). The gradient distribution among every block’s hole temperature is not even; the temperature difference in mid of block is larger than that of its outer. Therefore, please refer to the temperature displayed on the machine for every hole’s temperature when operating gradient block.



4. To upgrade the software
4.1 To install upgrading software

1) Choose and click “Setup.exe” in the CD, start up guide procedure, then press “Next ” to continue installation (refer to the picture below).

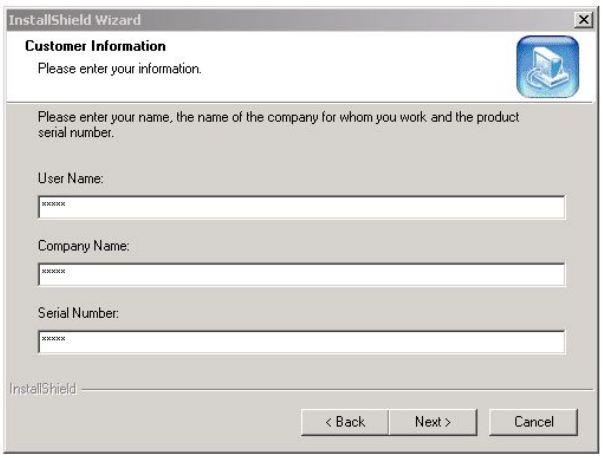
InstallShield Wizard
XP Cycler program Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel


InstallShield Wizard
Welcome to the InstallShield Wizard for XP Cycler program
The InstallShield® Wizard will install XP Cycler program on your computer. To continue, click Next.
< Back
Next >
Cancel

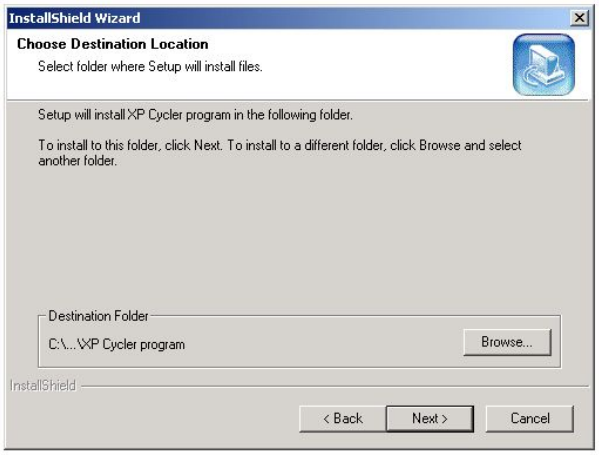
2) Please confirm “License Agreement” of the software (refer to the following picture), and press “Yes” to enter interface for registration.

InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
Software License Authority:
License:
Hangzhou Bioer Technology Co., Ltd. hereby authorize the application right of this software to you, with regard to your guaranty to our company: No amendment, decompilation or transaction of the System in whole or in partial is allowed.
Warranty:
The computer program shall be under the protection of Copyright Law and International Covenant. Any whole or partial copy, decompilation or spread of this program prior to
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install XP Cycler program, you must accept this agreement.
InstallShield
< Back
Yes
No

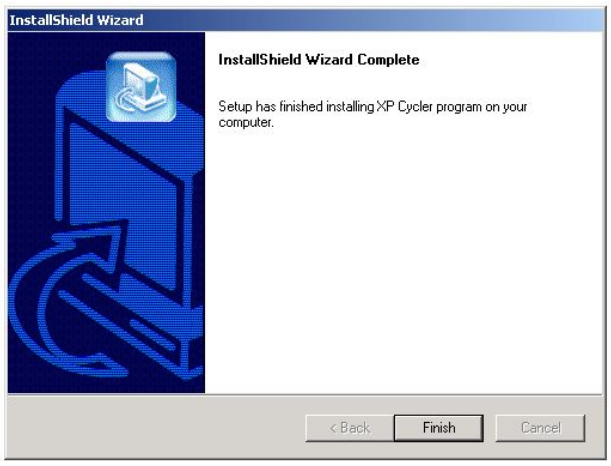
3) Please input your information (refer to the following picture), and press “Next” to enter installation interface.



4) Please select target installation folder (refer to the following picture), then press “Next” to enter the interface of installation. The guide procedure will finish installation automatically.

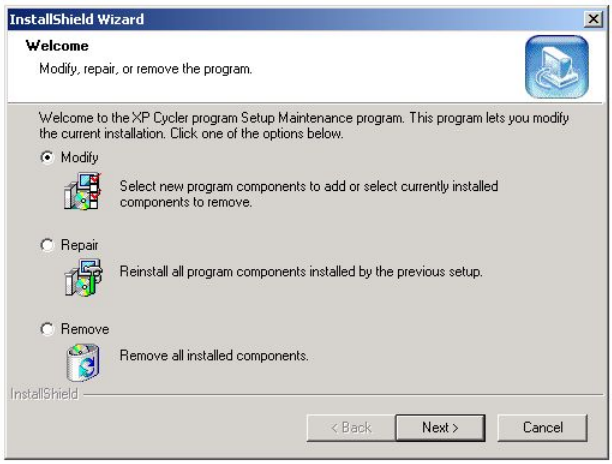

InstallShield Wizard
Choose Destination Location
Select folder where Setup will install files.
Setup will install XP Cycler program in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\...\XP Cycler program
Browse...
InstallShield
< Back
Next >
Cancel

5) When the guide procedure shows the installation is over, please confirm by pressing “Finish”.



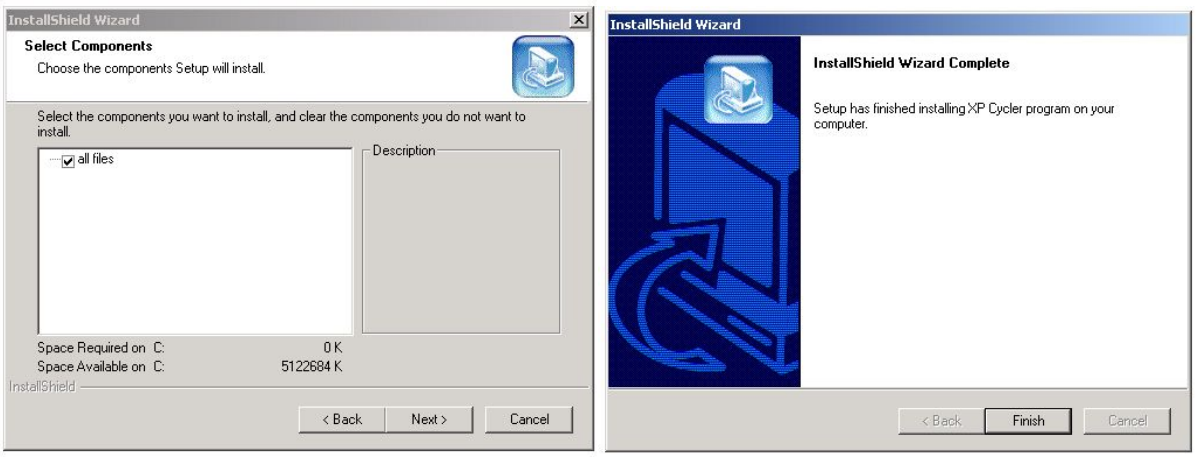
4.2 To modify, repair or remove the upgraded software

1) If there is an XP thermal cycler installation procedure in your computer, click “Setup” to start the guide to modify, repair or remove software (refer to the following picture). You can select “modify”, “repair” or “remove”, then press “next” to realize corresponding operation.


InstallShield Wizard
Welcome
Modify, repair, or remove the program.
Welcome to the XP Cycler program Setup Maintenance program. This program lets you modify the current installation. Click one of the options below.
Modify
Select new program components to add or select currently installed components to remove.
Repair
Reinstall all program components installed by the previous setup.
Remove
Remove all installed components.
InstallShield
< Back
Next >
Cancel

2) Click “Modify” and press “Next” to edit installation subassembly, press “Finish” to end this step (refer to the following picture).

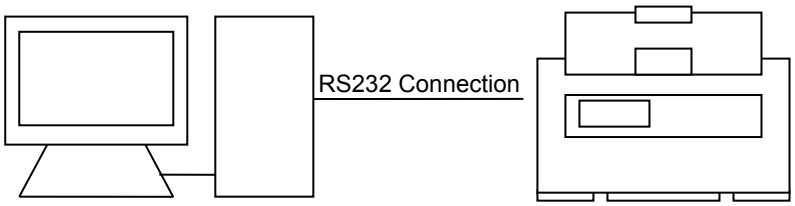
Note: It is necessary to select “installation file”. If you delete “ √ ” before “installation file”, it will cause incomplete software installation procedure in your operating system.



3) Click “Repair” and press “Next” to repair installation procedure. Press “Finish” to end this step.
Note: The shortage of “all files” can’t be repaired, but you can repair it by choosing “modify” function and then add “all files”.
4) Click “Remove” and press “Next” to delete installation procedure. Press “Finish” to end this step.

4.3 Preparation before upgrading

1) Install upgrading software of XP Thermal Cycler into your computer;
2) Copy latest upgrading procedure (*.bin) any folder in your computer;
3) Connect the interface of computer ,“COM1”with the interface of instrument, RS232;
4) Power on the machine, write down the setting value showed in the system parameter setting interface;
5) Turn back to the main menu and start software upgrading.



4.4 How to upgrade the software

1) Press and hold down F1 key while powering on the machine to enter software upgrade mode. The screen will display “Prepare to upgrade • • •”.
2) Click “start / programs / XP Cycler upgrade” or “XpUpgrade.exe” under the folder of upgrading software installation, the screen will show you the upgrading procedure interface (refer to Figure 1). Press “ Expand” to enter the expansion interface (refer to figure2). Press “Test” to test whether the RS232 connection is connected normally. If it is normal, the computer will display “communication is normal”. Press “Compress” to resume the original interface.
3) Press “Open”, and select upgrading procedure in the computer (*.bin).

4) Press “Start”, the computer will start to upgrade the software, and the screen of machine will display: “Receiving Data • • •”.
5) During software upgrading, the screen will display again: “Configuring Mode • • •”.
6) After software upgrading, the machine will remind you: “Upgrade Completed • • •”.
7) Power off the machine, then restart it to enter the system parameter setting interface, where you can reset the system parameter.
8) Software upgrading is finished.

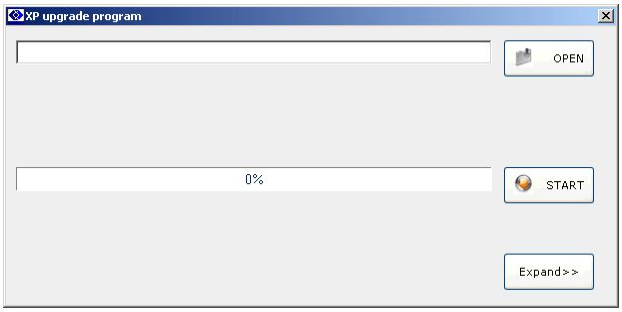


figure 1

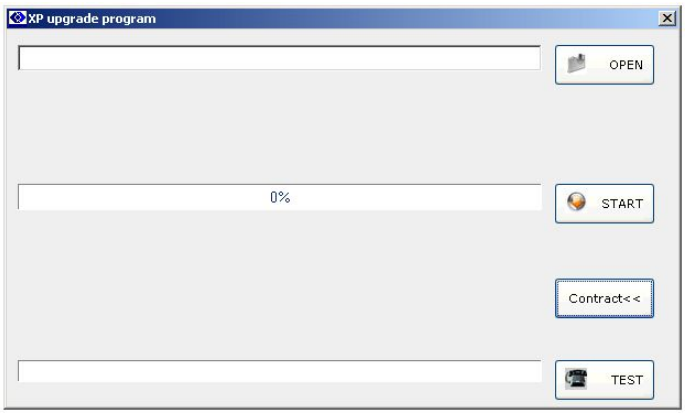


figure 2

Note： Check with the attribute of computer interface, COM1 if the it is connected abnormally.

1） Open the control panel of computer to click “Device Manager”, then double-click COM1(as figure 3).
2） Choose “Advanced” in “Communications Port(COM1) Properties”.
3) Revise the “COM Port Number” in “Advanced Settings for COM1"(as figure 4).

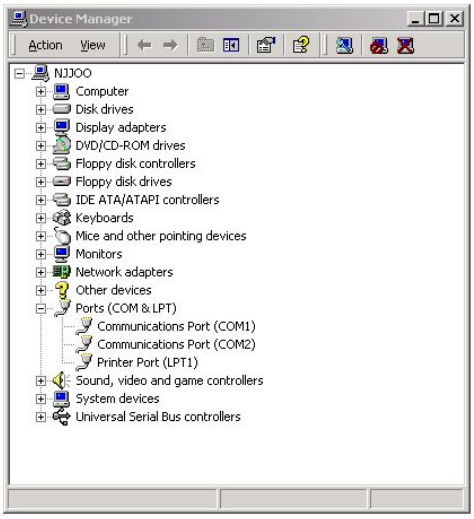


figure 3

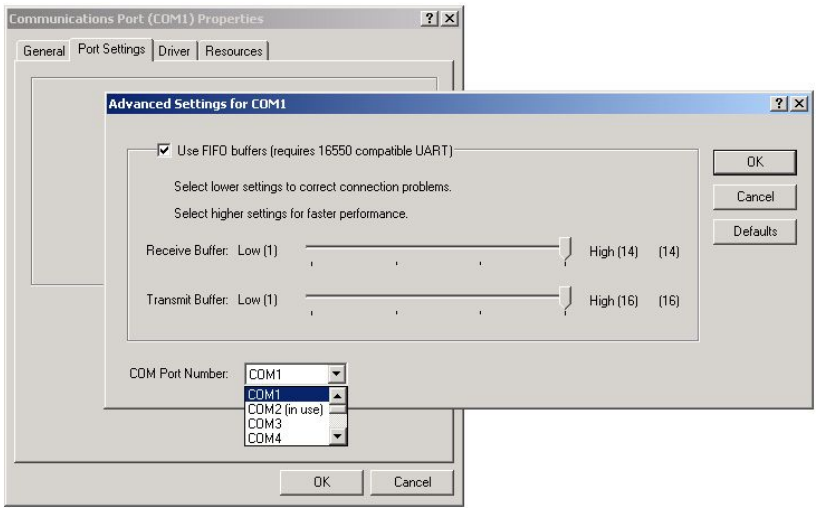


figure 4

Note：	The user can look through www.bioer.com.cn to download latest procedure.

CHAPTER 5 FAILURE ANALYSIS AND TROUBLESHOOTING

In this chapter, we briefly represent possible failures, reason analysis and troubleshooting.

1. Failure Analysis and Troubleshooting

No.	Phenomenon	Failure Analysis	Troubleshooting
1	No display and the two beeps missed when power on	Disconnected power supply	Check power supply for correct connection
		Bad fuse	Replace it (250V 5A Φ5×20mm)
		Switch failure	Replace it
		Others	Contact distributor or manufacturer
2	Abrupt change in heating speed or bad temperature control accuracy	Ventilation jam	Clear the jam
		Bad connection	Open the device, check the connectors for reliable connection
		Cooling module failure	Contact distributor or manufacturer
3	Significant change in cooling speed, or unavailable temperature below ambient one	Cooling module failure	Contact distributor or manufacturer
		Fan failed or stopped	
4	Heating and cooling terminated	Bad sensor	Contact distributor or manufacturer
		Malfunction of all cooling modules	
5	Lid cannot be heated	Bad contact between connectors	Contact distributor or manufacturer
		Loose connection between connectors	
		Lid heater failure	
		Lid sensor failure	
6	Abnormal characters displayed	Bad contact of chip with its socket	Contact distributor or manufacturer
		Chip malfunctioning	
7	Inactive keys	Film panel destroyed	Contact distributor or manufacturer
8	The setup of parameters is invalid	Failure to press“Save” button after the setup of parameters	Please refer to Section 1.2, 2.2 and 3.2 of Chapter4.

9	Reagent in the reaction tubes evaporated	Failure to set hot-lid temperature,but set the hot-lid as ”OFF”	Please refer to 《How to set the parameters》in the Section 1.2, 2.2, 3.2 of Chapter 4, to set the temperature of hot-lid.
		The reactin tubes are placed unevenly	Adjust the hole location of reaction tubes,and place the tubes symmetrically.
		The lid of reaction tubes are closed untightly	Please close the lid of tubes tightly before put them into the instrument.
10	RS232 interface line testing is unsuccessful	RS232 interface line is loose.	Power off the intrument,upgrade the software, and re-connect the RS232 interface line.
		Wrong setup of COM1 serial port of computer	Check whether the setup of “COM1” serial port of computer is correct or not. (Please refer to Section 4.4 of Chapter4.)

2. Single blocks Error message

No.	Error Message	Possible Reasons
1	Beep twice after power on. The Error Message on the display **“Please insert Block!”** with the beep sound	The connection of the block to the main is loosening.
		No block installed
		The block code is wrong.
2	Error Message when running: **“Please contact the distributor”** with **“Temperature sensor is disconnected”**	Block sensor connection bad or sensor broken
	Error Message when running: **“Please contact the distributor”** with any information below: **“Temperature sensor No.1 is disconnected” “Temperature sensor No.2 is disconnected” “Temperature sensor No.3 is disconnected”**	The related block sensor of XP-G block connection bad or broken
3	Error Message when running: **“Please contact the distributor”** with **“Heat sink sensor is disconnected”**	Heat sink sensor connection bad or sensor broken
4	Error Message when running: **“Please contact the distributor”** with **“Hotlid sensor is disconnected”**	Heat sink sensor connection bad or sensor broken

5	Error Message when running: **"Please contact the distributor"** with **"Temperature sensor is short-circuited"**	Temperature higher than 115℃, Block sensor connection bad or short circuit
	Error Message when running: **"Please contact the distributor"** with any information below: **"Temperature sensor No.1 is short-circuited"** **"Temperature sensor No.2 is short-circuited"** **"Temperature sensor No.3 is short-circuited"**	Temperature higher than 115℃,Block sensor connection of XP-G block bad or short circuit
6	Error Message when running: **"Please contact the distributor"** with **"Hotlid sensor is short-circuited"**	Temperature higher than 115℃, Hot-lid sensor connection bad or short circuit
7	Error Message when running:**"Please contact the distributor"** with **"Heatsink temperature is too high"**	Heat sink temp. higher than 70℃, the sensor broken or short circuit or the fan is not working.
8	Error Message when running:**"Please contact the distributor"** with **"AD1213 failure. Please contact the distributor."**	The singlechip can not communicate with the AD1213. AD1213 broken or circuit board trouble.

3. Dual Blocks Error Message

No.	Error Message	Possible Reasons
1	Beep twice after power on. The Error Message on the display **"Please insert Block!"** with the beep sound	The connection of the block to the main is loosening.
		No block installed
		The block code is wrong.
2	Error Message when running: **"Please contact the distributor"** with **"Temperature sensor is disconnected"**	Block sensor connection bad or sensor broken
3	Error Message when running: **"Please contact the distributor"** with **"Heat sink sensor unconnect"**	Heat sink sensor connection bad or sensor broken
4	Error Message when running: **"Please contact the distributor"** with **"Hotlid sensor is disconnected"**	Heat sink sensor connection bad or sensor broken
5	Error Message when running: **"Please contact the distributor"** with **"Temperature sensor is short-circuited"**	Temperature higher than 115℃,Block sensor connection bad or short circuit
6	Error Message when running: **"Please contact the distributor"** with **"Hotlid sensor is short-circuited"**	Temperature higher than 115℃, Hot-lid sensor connection bad or short circuit

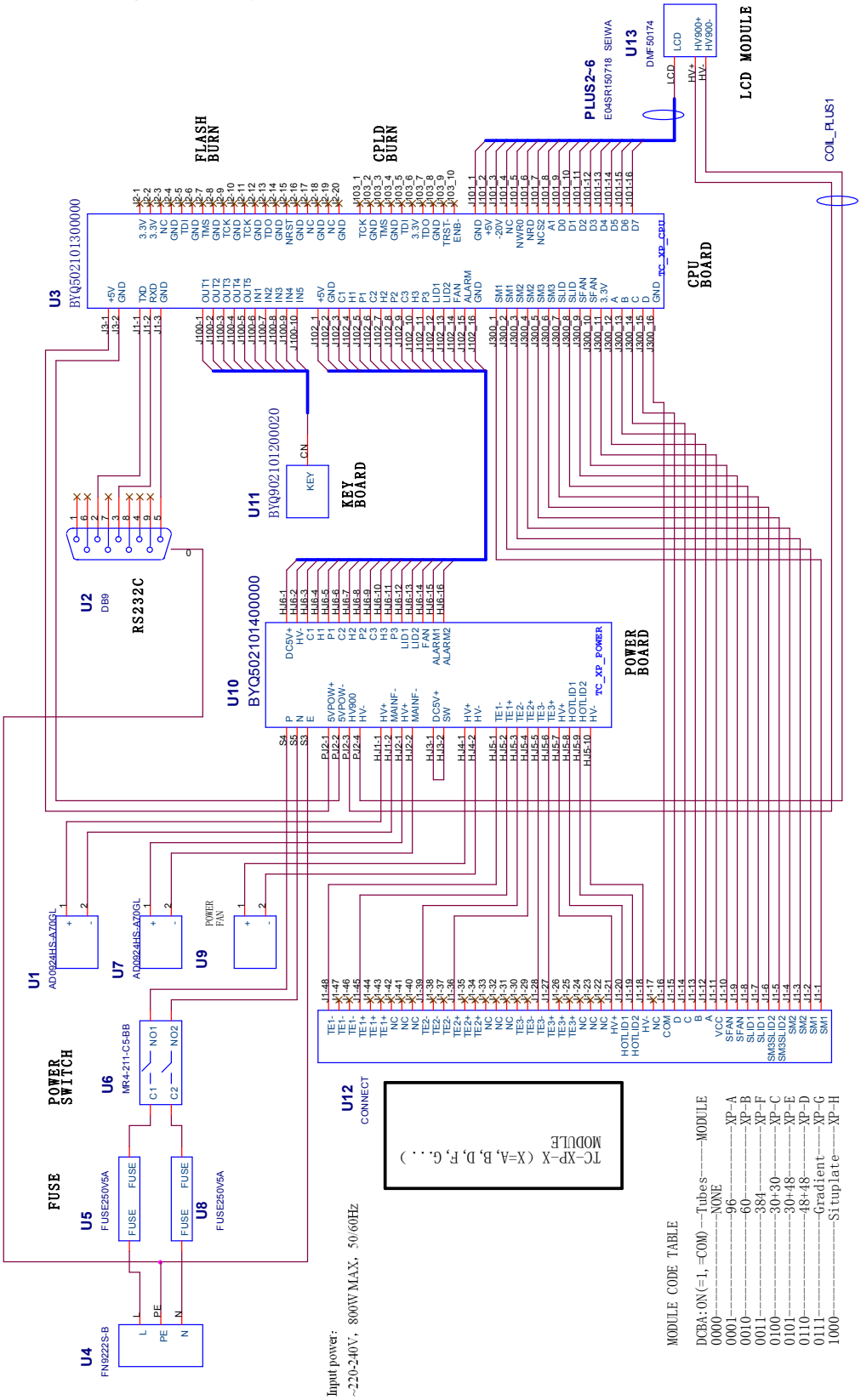
7	Error Message when running: **"Please contact the distributor"** with **"Heatsink temperature is too high"**	Heat sink temp. higher than 70℃， the sensor broken or short circuit or the fan is not working.
8	Error Message when running: **"Please contact the distributor"** with **"AD1213 failure. Please contact the distributor."**	The singlechip can not communicate with the AD1213. AD1213 broken or circuit board trouble.

Note: During warranty terms, please contact distributor or manufacturer if there is a need to open the device to check a failure listed in the above table.

Special Remind：
1.If the sample needs to be kept in instrument overnight , please set the temperature at 8~10℃.
2. Set the timer as "--:--" for infinity.

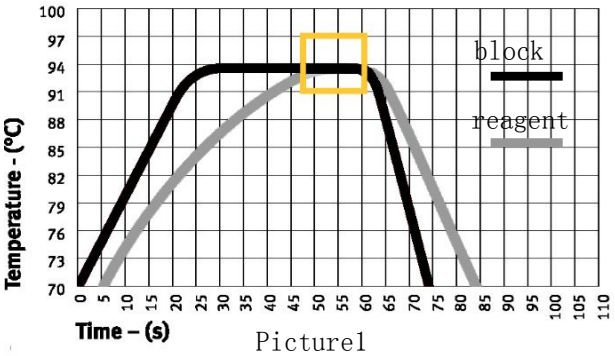
APPENDIX 1 Connection Diagram

(This diagram is regarded only as a reference, and it is a subject to change without prior notice. We apologize for any inconvenience caused.)

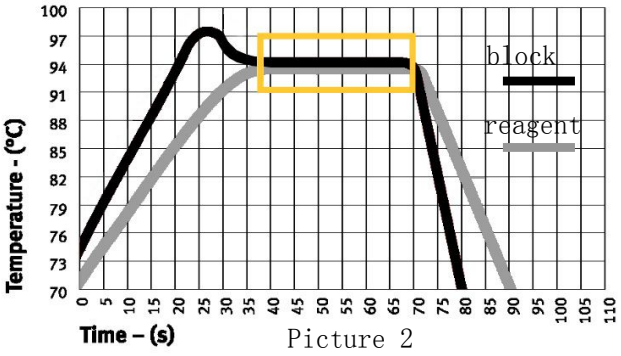


APPENDIX 2 Parameter Value & Meaning

Item	Parameter	Meaning	Range	Note
1	Temp(C)	Temp. Control point	4.0~99.0	
2	Time	Time of Temp. Control	00：00	The setting value showed in section 1 means time of temperature control is zero; The setting value showed after section 2 (including section 2) means the time is long limitlessly.
			00：01~59：59	
3	Ramp(C/S)	Ramping Rate （℃/Second）	0.1 ℃~1.9℃	
			#.#	Maximum of Ramping Rate
4	+Temp	Temp. Gain of Every Cycler	0.0℃~9.9℃	
5	+Time	Time Gain of Every Cycler	0:00~9:59	
6	Cycle ×00	Cycle Numbers	1~99	
	From 00 to 00	Section Numbers from beginning to the end	Any Section of Edit Program	
7	Grad.	Gradient Temp. Difference	0 ℃~30 ℃	
8	Date	Date	00（~99）-01（~12）-01（~31）	
9	Time	Time	00:00:00~23:59:59	
10	Default File	Default File Name	Defined By User	
11	Default User	Default User Name	Defined By User	
12	Control Mode	Control Mode	Block	Under this mode (reaching goal temperature namely entering the thermostatical state), the time for reagent's temperature under goal temperature is less than setting time (see Fig. 1).
			Tube	Under this mode (entering the thermostatical state after reaching goal temperature and decreasing about 3℃), reagent's temperature can be close to goal temperature very fast (see Fig. 2).
13	Sample Volume	Sample Volume（ul）	10~200	
14	Hotlid Temp	State of Hotlid: OFF	OFF	
		State of Hotlid: Open（℃）	30~99	
15	Block Temp	State of Block Temp during the heating of Hotlid（℃）	0~99	
16	Key Beep	Key Sound (ON or OFF)	OFF/ON	Humming
17	Run End Beep	Run End Sound (ON or OFF)	OFF/ON	Humming continuously



Picture1



Picture 2

NOTE: